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THE LYGEO-STIPETEA CLASS IN SICILY

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ABSTRACT - Basing on literature data and unpublished relevés from Sicily, a survey of the syntaxa belonging to the class *Lygeo-Stipetea* Rivas-Martínez 1978 is presented. This perennial vegetation is characterized by the dominance of big caespitose hemicryptophytes, and it is widely distributed in Sicily from the sea level up to 1500 m a.s.l. The class is represented in Sicily by two orders, floristically and ecologically well differentiated: *Lygeo-Stipetalia*, including the sole alliance *Moricandio-Lygeion* exclusively of clayey substrates, and *Hyparrhenietalia hirtae*, including five alliances (*Hyparrhenion hirtae, Avenulo cincinnatae-Ampelodesmion mauritanici, Thero-Brachypodion ramosi, Bromo-Oryzopsion miliaceae,* and *Arundion collinae*) occurring on various substrates. Within the class, 50 associations have been recognized. To support the syntaxonomic proposal, a multivariate numerical analysis, considering literature and personal data, has been performed. Nomenclature, floristic settlement, ecology, syndynamism and chorology are examined for each syntaxon.

KEY WORDS - SICILY, DRY GRASSLANDS, PHYTOSOCIOLOGY, LYGEO-STIPETEA.

INTRODUCTION

The wintergreen Mediterranean dry grasslands are constituted by perennial caespitose, or sometimes stoloniferous, bunchgrasses. In Sicily, this vegetation is widely distributed from the sea level up to 1500 m of altitude, often as a seral stage linked to the degradation of woodlands and maquis. These grasslands are quite an important topic in phytosociological research, as testified by several papers carried out in many Mediterranean territories, many of which dealing with Sicily (Gentile & Di Benedetto, 1961; Bartolo *et al.*, 1982; Brullo, 1984; 1985; Venturella *et al.*, 1986; Minissale, 1995; Brullo & Siracusa, 1996; 2000; Gianguzzi *et al.*, 1996; Brullo *et al.*, 1997; 1998; 2006; Ferro & Ladero-Alvarez, 1999; Minissale *et al.*, 2007; Giusso *et al.*, 2008; etc.).

The current paper aims at providing a general overview on the Sicilian wintergreen perennial dry grasslands, including both literature and unpublished data. The syntaxonomical framework is supported by a multivariate analysis.

Before presenting the outcomes, it is worth to spend some words on the nomenclatural vicissitudes con-

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cerning the syntaxonomical arrangement of this vegetation. As regards the class, even in recent times, some authors prefer to use the syntaxon *Thero-Brachypodietea* Br.-Bl. ex A. & O Bolòs 1950, rather than the *Lygeo-Stipetea* Rivas-Martínez 1978, the latter being considered by them as just a synonym of the former. In recent years, the adoption of one of the two names has been debated not only as a matter of nomenclatural priority, but also on what should be included in either class as well as on the methodology of the phytosociological sampling.

In its original description, the class *Thero-Brachypodietea*, created by Braun-Blanquet (see Braun-Blanquet *et al.*, 1947) and validly published by Bolos & Bolos (1950), was including both ephemeral meadows and perennial dry grasslands, with the single order *Thero-Brachypodietalia* including two alliances: *Thero-Brachypodion* Br.-Bl. 1925 and *Brachypodion phoenicoidis* Br-Bl. ex Molinier 1934. Afterwards, Braun-Blanquet & Bolos (1958) ascribed to the class *Thero-Brachypodietea*, a new order *Lygeo-Stipetalia*, grouping annual and perennial dry grasslands of the Ibero-Mauritanian territories.

In-depth floristic and structural investigations on these herbaceous plant communities, allowed to Rivas-Martínez (1978) to highlight that the Mediterranean dry grasslands consist of a mosaic, formed by more or less dense bunches of perennial grasses with clearings occupied by annual grasses. He claimed that annual and perennial plants, in spite of sharing the same physical space, occupy different ecological niches, by having a different structure, syndynamic role and ecological adaptations. For this reason, he proposed to make separate phytosociological relevés of the two aspects and, consequently, he ascribed the therophytic dry vegetation to the emended class *Tuberarietea guttatae* (Br.-Bl. in Br.-Bl. et al. 1952) Rivas Goday & Rivas-Martínez 1963, to which were originally ascribed just the acidophilous annual grasslands. The same author included in this class three orders: *Tuberarietalia guttatae* Br.-Bl. in Br.-Bl. & Wagner 1940, grouping acidophilous communities, *Malcolmietalia* Rivas Goday 1958, including psammophilous coenoses, and *Trachynietalia distachyae* Rivas-Martínez 1978, grouping the basiphilous ones.

Besides, Rivas-Martínez (l.c.) proposed a new class, *Lygeo–Stipetea*, to frame the perennial grasslands of the driest Mediterranean lands, to which the new order *Hyparrhenietalia* and the emended *Lygeo–Stipetalia* were attributed. At the same time, the alliance *Brachypodion phoenicoidis* was put into the order *Brachypodietalia phoenicoidis* Br-Bl. ex Molinier 1934, as it was in the original description proposed by Molinier (1934). This order is ascribed to the class *Festuco-Brometea* Br.-Bl. & R. Tx. ex Br.-Bl. 1949, grouping Euro-Siberian hemicryptophytic vegetation, stretching from the British Islands and Galicia (NW Spain) to Central Siberia, with some relict outposts on the main elevations of the Iberian Massif, on the Apennines (up to Mt. Pollino) and on the Balkans (Horvat *et al.*, 1974; Royer, 1991; Biondi *et al.*, 1995; Rivas-Martínez *et al.*, 2001; Brullo *et al.*, 2005).

The Rivas-Martínez syntaxonomical and methodological proposal is followed by Minissale (1995) and by most of the authors who studied the Sicilian dry grasslands (see Brullo *et al.*, 1997; 2002b; 2006). In recent years, Rivas-Martínez *et al.* (1999) decided to put the name *Lygeo-Stipetea* among the synonyms of the class *Thero-Brachypodietea*, because of the nomenclatural priority of the latter name. It must be admitted, however, that *Thero-Brachypodietea* is a *nomen ambiguum*, since it was previously used for grouping mainly the therophytic basiphilous vegetation of the Mediterranean territories. For this reason, the same authors (Rivas-Martínez *et al.*, 2001; 2002) proposed to use again the name *Lygeo–Stipetea* as *nomen conservandum*, according to the art. 52 of the International Code of Phytosociological Nomenclature (Weber *et al.*, 2000), as we do in the following paragraphs.

MATERIAL AND METHODS

The syntaxonomical survey presented in this paper is based on 681 phytosociological relevés (208 unpublished and 473 from literature) referring to 50

different associations from Sicily. The numerical analysis has been performed on the cover data of 98 selected relevés (Van der Maarel, 1979), two for each association (with the only exception of *Thapsietum pelagicae*), processed by the software package Syn-Tax 2000 (Podani, 2001). The relevés selected for the numerical analysis had been those in which the ratio between the total number of species and the character ones was minimized (Westhoff & Van der Maarel, 1973; Noest *et al.*, 1989). The chord distance algorithm was used to produce the dissimilarity matrix and the group average criterion was adopted to produce the classification dendrogram. By estimating the differences in the sequence of clustering level, six main groups of relevés have been recognized (Fig. 1). Vegetation data were interpreted in terms of syntaxonomical classification, based on cover and floristic affinities, following the Zürich-Montpellier approach (Braun-Blanquet, 1964) and the the International Code of Phytosociological Nomenclature (Weber *et al.*, 2000)

RESULTS

According to our results, the phytosociological relevés of the perennial dry grasslands of Sicily can be split firstly in two notably different groups, corresponding to the following orders of the class *Lygeo-Stipetea*:

Lygeo-Stipetalia, grouping the vegetation dominated by *Lygeum spartum*, that colonizes clayey soils and badlands that dry up and crack during the summer months.

Hyparrhenietalia hirtae, grouping grasslands growing on several different substrata, but never on seasonally dry clayey soils.

The order *Lygeo-Stipetalia* in Sicily is highly homogeneous and represented by the only alliance *Moricandio-Lygeion*. The order *Hyparrhenietalia hirtae*, instead, is much more heterogeneous, because it involves various types of plant communities with remarkable differences in the floristic settlement and ecologic requirements. Indeed, the numerical analysis highlighted five well defined sub-clusters into the main cluster. We esteem that they may correspond to the following five alliances:

Hyparrhenion hirtae, grouping the associations dominated by *Hyparrhenia hirta*, that typically colonize stony slopes and flattened sites with initial or heavily eroded soils, under very dry edaphic conditions, within infra-, thermo- and mesomediterranean bioclimatic belt.

Avenulo cincinnatae-Ampelodesmion mauritanici, grouping associations dominated by *Ampelodesmos mauritanicus*, mostly found on deep soils derived from marls, schists or limestones, under mesic edaphic conditions, chiefly within the meso- and thermomediterranean bioclimatic belt.

Thero-Brachypodion ramosi, grouping associations dominated by *Brachypodium retusum*, that colonize different kinds of soil, under mesic edaphic conditions, in rather disturbed habitats.

Bromo-Oryzopsion miliaceae, grouping subnitrophilous associations dominated by *Piptatherum miliaceum*, that is typically found in synanthropic habitats.

Arundion collinae, grouping sub-hygrophilous vegetation dominated by *Arundo collina* (=*A. plinii* auct. non Turra), that is frequently found on clayey soils that keep humid for most of the year.

It can be noted that in the cluster which corresponds to the alliance *Hyparrhenion hirtae* there are three more groups of relevés, which correspond to units that have been previously treated as distinct alliances (Brullo *et al.*, 1997; 2002b; Brullo & Siracusa, 2000). On the basis of the numerical analysis, these syntaxa are all included in the cluster A, as suballiances of the *Hyparrhenion hirtae*:

A1) *Hyparrhenenion hirtae* grouping thermo-xerophilous associations.

A2) *Aristido coerulescentis-Hyparrhenenion hirtae,* grouping the most thermo-xerophilous associations.

A3) *Panico repentis-Hyparrhenenion hirtae,* grouping associations growing in habitats with a short period

of edaphic wetness.

Apart from the three just-mentioned suballiances, the syntaxonomical frame proposed in this paper is in agreement with the current views, with two exceptions: the alliance *Thero-Brachypodion ramosi*, included by Rivas-Martínez *et al.* (1999; 2001; 2002) in the *Lygeo-Stipetalia*, is here ascribed to the *Hyparrhenietalia hirtae*, because of its floristic settlement and the evidences of the numerical analysis. Moreover, the alliance *Bromo-Oryzopsion miliaceae*, that has been recently framed in the class *Artemisietea vulgaris* Lohmeyer, Preising & Tüxen ex von Rochow 1951 by the same authors (Rivas-Martínez *et al.*, 1999; 2001; 2002), seems more properly to be ascribed to the order *Hyparrhenietalia hirtae*, due to the remarkable structural and floristic affinities with other syntaxa belonging to the same order.

SYNTAXONOMICAL SCHEME

The Sicilian plant communities of the *Lygeo-Stipetea* class are reported in following syntaxonomical scheme. Each association is examined from the nomenclatural, floristic, ecological, chorological and syndynamic viewpoint.

LYGEO-STIPETEA Rivas Martinez 1978

SYN.: *Thero-Brachypodietea* Br.-Bl. ex A. & O Bolòs 1950 *nom. amb. propos.* in Rivas-Martínez et al. 1999 (art.36); *Thero-Brachypodietea* Br.-Bl. in Br.-Bl., Emberger & Molinier 1947, *nom inval.* (art.2b)

CHARACTERISTIC SPECIES: *Allium arvense, Allium sphaerocephalon, Anthyllis vulneraria* subsp. *maura, Asperula aristata* subsp. *scabra, Asphodeline lutea, Asphodelus ramosus, Bituminaria bituminosa, Calamintha nepeta, Calendula suffruticosa* subsp. *fulgida, Carlina hispanica* subsp. *globosa, Carlina sicula, Centaurea nicaeensis, Charybdis maritima, Convolvulus cantabrica, Convolvulus elegantissimus, Dactylis hispanica, Elaeoselinum meoides,, Galium lucidum, Hypericum perfoliatum, Hypericum perforatum, Lobularia maritima, Micromeria consentina, Ornithogalum gussonei, Piptatherum miliaceum, Pallenis spinosa, Petrorhagia illyrica* subsp. *haynaldiana, Reichardia picroides, Sanguisorba minor* s.l., *Scabiosa atropurpurea, Scabiosa maritima, Scorzonera columnae, Sedum sediforme, Thapsia garganica, Verbascum sinuatum.*

DISTRIBUTION - Mediterranean and Macaronesian territories.

STRUCTURE AND ECOLOGY – This class groups perennial dry grasslands characterized by the dominance of big caespitose hemicryptophytes, chiefly belonging to the *Poaceae* family, whose ideal bioclimatic conditions are found within the thermo- and mesomediterranean thermotypes with dry to subhumid ombrotypes. The several plant communities included in this class are usually linked to very xeric environmental conditions and usually they can be found on many different substrates, mostly characterized by primitive and heavily eroded soils.

SYNDYNAMISM – This vegetation is mainly represented by secondary plant communities, linked to the woodland degradation processes due to fire, overgrazing, deforestation, and human over-exploitation, but they can be have also a primary role of edaphoclimacic type. In particular, fire has been traditionally used in the Mediterranean area especially for creating suitable pastures; such really intensive and long-lasting agro-pastoral land use favoured the establishment of these communities that in Sicily are dynamically connected with the degradation of oak woods (*Quercetalia ilicis*) or maquis (*Quercetalia calliprini*).

HYPARRHENIETALIA HIRTAE Rivas-Martínez 1978

CHARACTERISTIC SPECIES: *Andropogon distachyos, Carlina gummifera, Cachrys libanotis, Convolvulus althaeoides, Ferula communis, Foeniculum piperitum, Heteropogon contortus, Hyoseris radiata, Hyparrhenia hirta, Kundmannia sicula, Hyparrhenia sinaica, Lathyrus articulatus, Micromeria graeca, Phagnalon saxatile.*

DISTRIBUTION – See class.

STRUCTURE AND ECOLOGY – This order groups perennial dry grasslands occurring on several different substrata such as limestones, dolomites, granites, marls, gneiss, metamorphic and volcanic rocks. These communities are physiognomically character-

ized by the dominance of perennial bunchgrasses, such as *Hyparrhenia hirta, Ampelodesmos mauritanicus, Piptatherum miliaceum, Stipa* sp. pl., *Arundo collina,* etc. The maximum expression of this vegetation is found within the thermomediterranean belt, but not rarely it can also occurs into the infra- or mesomediterranean ones.

SYNDYNAMISM – This syntaxon includes secondary communities dynamically linked to the thermophilous woods of *Quercetalia ilicis* or *Quercetalia calliprini* maquis. Primary stands are less common and usually circumscribed to rocky outcrops or steep slopes where the vegetation evolution is locally hampered by the severe edaphic and microclimatic conditions of the site.

HYPARRHENION HIRTAE Br.-Bl., P. Silva & Rozeira 1956

SYN.: *Saturejo-Hyparrhenion hirtae* O.Bolòs 1961, *nom. illeg.* (art. 22)

CHARACTERISTIC SPECIES: see order.

DISTRIBUTION – See order.

STRUCTURE AND ECOLOGY – The alliance groups dry grasslands linked to rocky habitats and characterized by the dominance of *Hyparrhenia hirta.*

SYNDYNAMISM – See order.

HYPARRHENENION HIRTAE Brullo, Minissale & Spampinato suball. nov.

HOLOTYPUS: *Hyparrhenietum hirto-pubescentis* A.& O.Bolòs & Br.-Bl. in A. & O. Bolòs 1950, hoc loco.

CHARACTERISTIC SPECIES: see alliance.

DISTRIBUTION – See alliance.

STRUCTURE AND ECOLOGY – See alliance.

SYNDYNAMISM – See alliance.

Hyparrhenietum hirto-pubescentis A.& O.Bolòs & Br.-Bl. in A.& O. Bolòs 1950 (Table 1, 2A)

CHARACTERISTIC SPECIES: *Andropogon distachyos.*

DISTRIBUTION – Mediterranean.

DISTRIBUTION IN SICILY – Widespread all over Sicily.

STRUCTURE AND ECOLOGY – Xerophilous plant community growing on lithosoils derived from the erosion of different substrates. It is widespread from the sea level up to 1000 m of altitude, within the thermo- and mesomediterranean dry-subhumid belt. Floristically, it is differentiated by the dominance of *Hyparrhenia hirta* which is usually associated with *Andropogon distachyos.* This grassland often covers wide surfaces, on gently o steep slopes characterized by rocky outcrops and primitive soils.

SYNDYNAMISM – This phytocoenosis chiefly derives from the degradation of thermophilous oak woods or maquis belonging to the *Quercetea ilicis*. Human disturbance (such as frequent fires, overgrazing, etc.) creates suitable conditions for the establishment of such community, which can also play an important role in the re-colonization processes of abandoned fields.

Ferulo communis-Hyparrhenietum hirtae Brullo & Siracusa 1996 (Table 1, 3)

CHARACTERISTIC SPECIES: *Ferula communis.*

DISTRIBUTION – Hitherto known only for Sicily.

DISTRIBUTION IN SICILY – This association was firstly described by Brullo & Siracusa (1996) for the islet of Linosa (Pelagian Archipelago), and afterward it was found in many other localities of Sicily.

STRUCTURE AND ECOLOGY – This association usually develops on deep soils derived from the degradation of many different substrata, but always with a fairly good content of clay. The altitudinal range of this coenosis is rather variable and wide, since it was found from the sea level up to about 600-700 m a.s.l., within the thermo-mediterranean dry-subhumid belt. It seems that, for its ecological requirements, this community has its optimum at higher altitudes, thus becoming one of the most mesophilous association of the alliance *Hyparrhenion hirtae*.

SYNDYNAMISM – This association occurs in second-

ary habitats, related to the irreversible degradation of woodlands or maquis (*Quercetea ilicis)*, as well as to the ruderalization of formerly cultivated areas. A relevant role of this phytocoenosis can be played in the colonization processes of volcanic substrates (lava flows, basaltic outcrops, etc.).

Ferulago nodosae-Hyparrhenietum hirtae Minissale, Sciandrello & Spampinato 2007 (Table 1, 4)

CHARACTERISTIC SPECIES: *Ferulago nodosa.*

DISTRIBUTION – Likely endemic of Sicily.

DISTRIBUTION IN SICILY – South-eastern Sicily (Hyblaean Plateau).

STRUCTURE AND ECOLOGY – This association usually grows on initial and eroded soils mainly derived from Miocene limestones. It prefers more or less steep slopes of deep river valleys, where it colonizes rocky stands. Its ideal ecological conditions are found within the thermomediterranean sub-humid bioclimatic belt. This grassland, dominated by *Hyparrhenia hirta*, is characterized by the occurrence of *Ferulago nodosa,* eastern Mediterranean element, whose cover values can be rather high.

SYNDYNAMISM – This association is dynamically connected with the degradation of woods referable to the *Pistacio-Quercetum ilicis* or *Oleo-Quercetum virgilianae* (see Minissale *et al.*, 2007).

Cachryo pungentis-Hyparrhenietum hirtae Brullo, Minissale & Sciandrello ass. nov. (Table 1, 5)

HOLOTYPUS: rel.6, tab.5, hoc loco.

CHARACTERISTIC SPECIES: *Cachrys pungens.*

DISTRIBUTION – Likely endemic of Sicily.

DISTRIBUTION IN SICILY – Central-southern Sicily.

STRUCTURE AND ECOLOGY – This association is typically found on stands characterized by particularly xeric conditions and sandy soils. It is exclusively localized on flat sites, between 100 and 400m of altitude, within the thermomediterranean dry belt. The physiognomy of this grassland is given by *Cachrys pungens,* thermophilous species with a south-western Mediterranean distribution.

SYNDYNAMISM – Secondary vegetation derived from the degradation of cork-woods ascribed to the *Stipo bromoidis-Quercetum suberis* Barbagallo 1983. Frequent fires, as well as any other persisting disturbance, initially favour the establishment of psammophilous garigues belonging to the *Cisto-Ericion* and, subsequently, dry grasslands represented by the association at issue.

Euphorbio terracinae-Hyparrhenietum hirtae Brullo & Siracusa 1996 (Table 1)

CHARACTERISTIC SPECIES: *Euphorbia terracina.*

DISTRIBUTION – Hitherto known only for Linosa (Pelagian Archipelago), but it could occur also in other coastal sites of Sicily.

DISTRIBUTION IN SICILY – Linosa (Pelagian Archipelago).

STRUCTURE AND ECOLOGY – Association growing on incoherent substrata, chiefly represented by volcanic ashes on very steep sloping stands. It occurs within the inframediterranean dry belt, in very xeric ecological conditions (Brullo & Siracusa, 1996). This grassland is characterized by the dominance of *Hyparrhenia hirta*, which is associated with *Euphorbia terracina,* psammophilous species.

SYNDYNAMISM – ssociation occurring on primary stands where the normal soil evolution is extremely slow, while secondary aspects can develop as a consequence of degradation processes of xerophilous maquis of *Periploco-Euphorbietum dendroidis* Brullo, Di Martino & Marcenò 1977.

Oryzopsio pauciflorae-Hyparrhenietum hirtae Bartolo, Brullo, Minissale & Spampinato 1990 (Table 1)

CHARACTERISTIC SPECIES: *Allium pallens, Piptatherum miliaceum* subsp. *pauciflorum.*

DISTRIBUTION – Endemic of Sicily.

DISTRIBUTION IN SICILY – Lampedusa (Pelagian Archipelago).

STRUCTURE AND ECOLOGY – Dry grassland growing on sheltered stands with primitive soils and rocky outcrops. It prefers flat or gently sloping stands of small valleys within the inframediterranean dry belt. This floristically poor communitiy is characterized by the occurrence of *Piptatherum miliaceum* subsp. *pauciflorum,* N African element, usually mixed with *Hyparrhenia hirta*.

SYNDYNAMISM – In rocky and steep stands this association plays a primary role, while, in disturbed habitats, it can be considered a degradation aspect of *Periplocion angustifoliae* maquis.

Sanguisorbo verrucosae-Magydaretum pastinaceae Bartolo, Brullo, Minissale & Spampinato 1990 (Table 1)

CHARACTERISTIC SPECIES: *Magydaris pastinaca, Sanguisorba verrucosa*.

DISTRIBUTION – Known only from Sicily.

DISTRIBUTION IN SICILY – Described from Lampedusa (Pelagian Archipelago), but it likely occurs also in north-western Sicily and Egadi Islands.

STRUCTURE AND ECOLOGY – This association is chiefly localized at the bottom of valleys, where soils are particularly rich in coarse fragments deriving from the erosion of calcareous cliffs. This coenosis is typically linked to sheltered stands within the infra- and thermomediterranean dry belt. The physiognomy of this community is given by *Magydaris pastinaca,* huge umbellifer occurring in the western Mediterranean territories.

SYNDYNAMISM – Pioneer association localized within the xerophilous maquis of *Periplocion angustifoliae* or *Oleo-Ceratonion*.

Hyparrhenio hirtae-Festucetum humifusae Brullo & Guarino ass. nov. (Table 1, 6)

HOLOTYPUS: rel.2, tab.6, hoc loco.

CHARACTERISTIC SPECIES: *Festuca humifusa*.

DISTRIBUTION – Endemic of Sicily.

DISTRIBUTION IN SICILY – North-eastern Sicily (exclusively localized in the north-facing slopes of Tindari).

STRUCTURE AND ECOLOGY – This association grows on very steep coastal slopes from the sea level up to 250 m a.s.l., within the thermomediterranean subhumid belt. It dwells really incoherent substrates characterized by carbonatic or flyschoid soils. From the floristic and physiognomical viewpoint, this coenosis is characterized by the dominance of *Festuca humifusa*, rare Sicilian endemism, and *Hyparrhenia hirta*.

SYNDYNAMISM - Plant community dynamically connected with the degradation of *Oleo-Ceratonion* maquis.

Stipo gussonei-Hyparrhenietum hirtae Brullo & Scuderi ass. nov. (Table 1, 7A)

HOLOTYPUS: rel.7, tab.7, hoc loco.

CHARACTERISTIC SPECIES: S*tipa gussonei, Echinophora tenuifolia*.

DISTRIBUTION – Endemic of Sicily.

DISTRIBUTION IN SICILY – Central-southern and western Sicily.

STRUCTURE AND ECOLOGY – This association grows exclusively on flat sites characterized by sandy soils, within the thermomediterranean dry bioclimatic belt. Its ideal ecologic conditions are found in particularly xeric habitats, quite far from the coast, and characterized by the occurrence of paleosoils with a low water capacity. This coenosis is floristically differentiated by two rare Sicilian endemisms, S*tipa gussonei* and *Echinophora tenuifolia*.

SYNDYNAMISM – Secondary community derived from the degradation of cork-woods ascribed to the *Stipo bromoidis-Quercetum suberis* Barbagallo 1983.

Thapsietum pelagicae C. Brullo & Brullo ass. nova (Table 1, 2B)

SYN.: *Thapsio-Feruletum communis* Bartolo, Brullo, Minissale & Spampinato 1990 non Brullo 1984.

HOLOTYPUS: rel.5, tab.2B, hoc loco.

CHARACTERISTIC SPECIES: *Thapsia pelagica.*

DISTRIBUTION – Endemic of Sicily.

DISTRIBUTION IN SICILY – Lampedusa (Pelagian Archipelago).

STRUCTURE AND ECOLOGY – Association colonizing flat or gently sloping stands characterized by heavily eroded soils with rocky outcrops. It is linked to really xeric environmental conditions, having its optimum within the inframediterranean arid bioclimatic belt. The physiognomy of this community is given by *Thapsia pelagica,* endemic species of Lampedusa recently described by Brullo *et al.* (2009). This vegetation, even if floristically quite poor, was previously referred by Bartolo *et al.* (1990) to the *Thapsio garganicae-Feruletum communis.*

SYNDYNAMISM – Association dynamically connected with the climatophilous series of *Periplocion angustifoliae.*

PANICO REPENTIS-HYPARRHENENION HIRTAE (Brullo & Siracusa 2000) stat. nov.

SYN.: *Panico-Hyparrhenion hirtae* Brullo & Siracusa 2000

CHARACTERISTIC SPECIES: *Panicum repens.*

DISTRIBUTION – Southern Italy and Sicily.

STRUCTURE AND ECOLOGY – The communities belonging this syntaxon are represented by perennial grasslands dominated by *Hyparrhenia hirta* and linked to peculiar habitats characterized by a fairly good water availability also during the summer months.

SYNDYNAMISM – This suballiance groups several communities whose evolution is hampered by the peculiar ecological conditions of the growing sites. In particular, they are in contact both with the halonitrophilous vegetation of *Pegano-Salsoletea* and the hygrophilous communities ascribed to the *Phragmito-Magnocaricetea* (Brullo & Siracusa, 2000).

Imperato cylindricae-Hyparrhenietum hirtae Brullo & Siracusa 2000 (Table 1)

CHARACTERISTIC SPECIES: *Imperata cylindrica.*

DISTRIBUTION – Sicily and Calabria.

DISTRIBUTION IN SICILY – Eastern Sicily (near Adrano). Recently found also along the southern coast of Sicily (Pozzallo - Ragusa).

STRUCTURE AND ECOLOGY – Association colonizing flat or gently sloping sites with clayey and slightly salty soils. It is usually found within the thermomediterranean dry bioclimatic belt. Physiognomically dominated by *Hyparrhenia hirta*, whose cover values are usually rather high, but also by *Imperata cylindrica* and *Panicum repens*. The latter two species seem to be really well adapted to these habitats characterized by loamy soils, particularly rich in nitrates and chlorides.

SYNDYNAMISM – This vegetation can be considered as a permanent community linked to superficial water flooding, especially during the late autumn (Brullo & Siracusa, 2000).

Dichanthio annulati-Hyparrhenietum hirtae Brullo & Siracusa 2000 (Table 1)

CHARACTERISTIC SPECIES: *Dichanthium annulatum.*

DISTRIBUTION – Endemic of Sicily.

DISTRIBUTION IN SICILY – Eastern Sicily (near Adrano).

STRUCTURE AND ECOLOGY – As the previous association, also this one is found on loamy and clayey soils, even if with a lower water capacity. In fact, this coenosis colonizes quite steep slopes, and it is floristically differentiated not only for the lacking of *Imperata cylindrica*, but also for the occurrence of *Dichanthium annulatum,* thermophilous species coming from the Tropical region.

SYNDYNAMISM – This association represents a permanent community, in contact with the *Imperato cylindricae-Hyparrhenietum hirtae.*

Phalarido coerulescentis-Hyparrhenietum hirtae Scuderi ass. nov. (Table 1, 7C)

HOLOTYPUS: rel.10, tab.7, hoc loco.

CHARACTERISTIC SPECIES: *Phalaris coerulescens.*

DISTRIBUTION – Hitherto known only for Sicily.

DISTRIBUTION IN SICILY – Western Sicily (Trapani).

STRUCTURE AND ECOLOGY – Association chiefly found on clayey substrates characterized by a fairly good water availability as testified by the occurrence of *Phalaris coerulescens*. In fact, this hygrophilous species has its ideal ecologic conditions on flat or gently sloping surfaces, periodically flooded. This coenosis, probably for the peculiar environmental conditions where it grows, is floristically extremely poor and physiognomically characterized by two species, *Panicum repens* and *Hyparrhenia hirta*.

SYNDYNAMISM – Permanent association placed between the hygrophilous communities of *Caricetum hispidae* and those more xeric of *Plantaginetalia majoris*.

ARISTIDO CAEREULESCENTIS-HYPARRHENENION HIRTAE (Brullo, Scelsi & Spampinato 1997) stat. nov.

SYN: *Aristido-Hyparrhenion hirtae* Brullo, Scelsi & Spampinato 1997

CHARACTERISTIC SPECIES: *Aristida caerulescens, Cenchrus ciliaris, Tricholaena teneriffae, Pennisetum setaceum*.

DISTRIBUTION – Macaronesia and S Mediterranean area.

STRUCTURE AND ECOLOGY – It groups perennial dry grasslands linked to particularly xeric environmental conditions and characterized by the dominance of *Hyparrhenia hirta*. These phytocoenoses having their ecological optimum within the thermo- or inframediterranean dry bioclimatic belt.

SYNDYNAMISM – In Sicily, all the associations belonging to this suballiance are dynamically connected with maquis of *Oleo-Ceratonion,* while in the Ibero-Mauritanian territories the plant communities of this syntaxon chiefly derives from the degradation of thermo-xerophilous maquis of *Rhamnion oleoidis* Rivas Goday ex Rivas-Martínez 1975 or *Periplocion angustifoliae* Rivas-Martínez 1975 (see Brullo *et al.*, 1997).

Tricholaeno teneriffae-Hyparrhenietum hirtae (Wildpret & Rodriguez in Rivas-Martínez et al. 1993) Brullo, Scelsi & Spampinato 1997 (Table 1)

SYN.: *Cenchro ciliaris-Hyparrhenietum hirtae* Wildpret & Rodriguez in Rivas-Martínez et al. 1993 subass. *tricholaenetosum teneriffae* Wildpret & Rodriguez in Rivas-Martínez et al. 1993; *Andropogonetum hirto-pubescentis* Br.-Bl. in A. & O. Bolos 1950 *tricholaenetosum teneriffae* Díez-Garretas & Asensi 1999

CHARACTERISTIC SPECIES: *Tricholaena teneriffae*.

DISTRIBUTION – Canary Islands (Rivas-Martínez *et al.*, 1993; Díez-Garretas & Asensi, 1999) and central Mediterranean (southern Calabria and Sicily).

DISTRIBUTION IN SICILY – North-western Sicily (Peloritani Range).

STRUCTURE AND ECOLOGY – This association colonizes coastal habitats (never above 250 m a.s.l.) characterized by sandy soils. It has its optimum within the thermomediterranean subhumid bioclimatic belt, but, considering the soil composition and granulometry, it appears to be well adapted to markedly xeric edaphic conditions. The physiognomy is given by *Hyparrhenia hirta* and *Tricholaena teneriffae*, both reaching high cover values even on steep sloping stands.

SYNDYNAMISM – In those environments where the vegetation evolution is hampered by frequent landslides, this association represents a permanent community. It may occur also in secondary stands where it replaces disappeared woody or shrubby phytocoenoses of *Oleo-Ceratonion*.

Cenchro ciliaris-Hyparrhenietum hirtae Wildpret & Rodriguez in Rivas-Martínez et al. 1993 (Table 1)

CHARACTERISTIC SPECIES: *Cenchrus ciliaris*.

DISTRIBUTION – Sicily and Canary Islands

DISTRIBUTION IN SICILY – Palermo, Taormina and Aeolian Islands.

STRUCTURE AND ECOLOGY – This plant community

dwells south-facing and xeric habitats characterized by eroded soils deriving from the degradation of carbonatic, volcanic and metamorphic rocks. It founds its ideal ecologic conditions within the thermomediterranean subhumid belt, where the peculiar edaphic conditions of the growing sites hamper the evolution of this coenosis towards more mature stages. From the floristic viewpoint, it is characterized by the occurrence of *Cenchrus ciliaris* and *Hyparrhenia hirta*.

SYNDYNAMISM – The primary habitat of this grassland are represented by semi-rupestrian rocky places, while in secondary stands, it occupies areas potentially colonized by shrubby communities with *Euphorbia dendroides*.

Bothriochloo panormitanae-Hyparrhenietum hirtae Brullo, Scelsi & Spampinato 1997 (Table 1, 7B)

CHARACTERISTIC SPECIES: *Bothriochloa panormitana, Megathyrsus bivonianus*.

DISTRIBUTION – Endemic of Sicily.

DISTRIBUTION IN SICILY – North-western Sicily (coastal sites from Palermo to Trapani)

STRUCTURE AND ECOLOGY This association grows on Mesozoic limestones with scarcely developed soils. It has its optimum in coastal stands within the thermomediterranean dry bioclimatic belt. This grassland is floristically quite poor, probably for the limited soil nutrient and water availability of the growing sites. The dominant species is *Bothriochloa panormitana* which is, like *Megathyrsus bivonianus*, an endemic species extremely localized in Sicily. Besides, *Hyparrhenia hirta* and other big bunchgrasses, like *Cenchrus ciliaris* and *Heteropogon contortus,* are also frequent in this coenosis.

SYNDYNAMISM – On steep and rocky slopes this vegetation represents a permanent primary community, while on screes or disturbed habitats it is dynamically connected to the maquis of *Oleo-Ceratonion*.

Penniseto setacei-Hyparrhenietum hirtae Gianguzzi, Ilardi & Raimondo 1996 (Table 1)

CHARACTERISTIC SPECIES: *Pennisetum setaceum*.

DISTRIBUTION – Hitherto known only for Sicily.

DISTRIBUTION IN SICILY – Coastal territories of north-western Sicily (Gianguzzi *et al.*, 1996) and eastern Sicily (near Catania).

STRUCTURE AND ECOLOGY – Pioneer dry grassland occurring on carbonatic or volcanic rocks. It chiefly dwells abandoned fields, uncultivated ruderal areas and road sides within the thermomediterranean dry bioclimatic belt. Physiognomically, this *Hyparrhenia hirta* grassland is differentiated by *Pennisetum setaceum*, alien species coming form the subtropical region, and nowadays widely spread along the coast of north-western and eastern Sicily.

SYNDYNAMISM – This vegetation usually replaces other coenoses physiognomically dominated by *Hyparrhenia hirta*. In fact, the recent invasion of *Pennisetum setaceum* in these secondary habitats led to transition towards this coenosis.

AVENULO CINCINNATAE-AMPELODESMION MAURITANICI Minissale 1995

CHARACTERISTIC SPECIES: *Avenula cincinnata, Ampelodesmos mauritanicus, Pimpinella anisoides, Scorzonera columnae, Gypsophila arrostii, Dianthus graminifolius, Eryngium bocconei, Helminthotheca aculeata*.

DISTRIBUTION – Central Mediterranean (southern Italy, Sicily and Tunisia).

DISTRIBUTION IN SICILY – Widespread in Sicily.

STRUCTURE AND ECOLOGY – This alliance groups dry grasslands widely spread all over the island and occurring on deep soils, usually limestones or marls, where the original woody vegetation is definitively disappeared. All the plant communities included in this alliance are characterized by the dominance of *Ampelodesmos mauritanicus,* big caespitose bunchgrass with a south-western Mediterranean distribution. Other Mediterranean bunchgrasses typical of dry habitats, such as *Helictotrichon convolutum, Hyparrhenia hirta,* and *Stipa* sp. pl., occur too.

SYNDYNAMISM – In Sicily, the grasslands belonging to this alliance are chiefly connected with the dynamic series of *Quercetea ilicis,* but not so rarely also with climatophilous communities of *Querco-Fagetea* class (Brullo *et al.*, 1998). Initial degradation of deciduous or evergreen oak woods drives to the establishment of shrubby communities (maquis or garigues), where *Ampelodesmos mauritanicus* occurs only sporadically. But persisting human disturbance, especially fires, brings about a further regression of the woody vegetation favouring these grasslands (Minissale, 1995; Brullo *et al.*, 2001).

Helichryso hyblaei-Ampelodesmetum mauritanici Minissale 1995 (Table 8)

CHARACTERISTIC SPECIES: *Helichrysum hyblaeum.*

DISTRIBUTION – Endemic of Sicily.

DISTRIBUTION IN SICILY – South-eastern Sicily (Hyblaean Plateau).

STRUCTURE AND ECOLOGY – Association growing on carbonatic substrates (limestones, marls, etc.) within the thermomediterranean subhumid bioclimatic belt, at an altitude of 200-800 m a.s.l. From the structural and physiognomical viewpoint, this community appears as a quite homogeneous and dense grassland dominated by *Ampelodesmos mauritanicus*. The key species of this association is *Helichrysum hyblaeum*, Sicilian endemism circumscribed to this area, whose cover values can be rather high.

SYNDYNAMISM – Thy grassland is dynamically connected with the degradation of oak woods occurring in the Hyblaean territory, such as *Oleo-Quercetum virgilianae* Brullo 1984 and *Doronico-Quercetum ilicis* Barbagallo, Brullo & Fagotto 1979. Degradation of these woodlands, due to frequent fires and coppicing, usually drive to the establishment of garigues of *Cisto-Ericion,* and then to this *Ampelodesmos mauritanicus* vegetation.

Helictotricho convoluti-Ampelodesmetum mauritanici Minissale 1995

CHARACTERISTIC SPECIES: *Helictotrichon convolutum, Eryngium crinitum, Festuca caerulescens, Klasea mucronata, Oncostema cerulea, Delphinium emarginatum, Trisetum splendens.*

a) *typicum* (Table 8, 9B)

DISTRIBUTION – Endemic of Sicily.

DISTRIBUTION IN SICILY – Central and western Sicily.

STRUCTURE AND ECOLOGY – This grassland usually occurs on rocky stands characterized by initial soils derived from Mesozoic limestones, at an altitude of 50-1000 m. The optimal aspect of this association is found within the mesomediterranean subhumid belt, even if, often, it occurs also in the thermomediterranean belt . It is physiognomically characterized by the dominance of *Ampelodesmos mauritanicu*s, which is usually mixed to scattered individuals of *Helictotrichon convolutum.*

SYNDYNAMISM – This community usually represents the regressive stage of many different woodlands common in western Sicily, chiefly represented by Holm oak woods (*Rhamno-Quercetum ilicis* Brullo & Marcenò 1985 or *Aceri campestris-Quercetum ilicis* Brullo 1984) occurring on north-facing stands of coastal sites or on mountain stands above 900 m of altitude (Minissale, 1995). In the inland this association is dynamically linked to the degradation processes of *Oleo-Quercetum virgilianae.*

b) *stipetosum appendiculatae* C.Brullo, Brullo & Giusso, subass. nov. (Table 8, 9C)

HOLOTYPUS: rel.14, tab.9, hoc loco.

CHARACTERISTIC SPECIES – *Stipa austroitalica* subsp. *appendiculata, S. barbata.*

DISTRIBUTION IN SICILY – North-western Sicily.

STRUCTURE AND ECOLOGY – This vegetation replaces the previous one on windy and rocky ridges. The occurrence of *Stipa austroitalica* subsp. *appendiculata* and *S. barbata* clearly identifies this vegetation.

SYNDYNAMISM – Edaphophilous community colonizing semi-rupestrian habitats, showing usually contact with the chasmophilous coenoses of *Di-*

anthion rupicolae Brullo & Marcenò 1979.

Seselio tortuosi-Ampelodesmetum mauritanici Minissale 1995 (Table 8, 9A)

CHARACTERISTIC SPECIES: *Klasea cichoracea, Seseli tortuosum* var. *tortuosum*.

DISTRIBUTION – Southern Italy and Sicily.

DISTRIBUTION IN SICILY – Central, southern and north-eastern Sicily.

STRUCTURE AND ECOLOGY – This association colonizes usually stands with marly, carbonatic or calcarenitic substrates, between 300 and 800 m of altitude. Its optimal aspects are found within the thermo- and mesomediterranean subhumid bioclimatic belt. The physiognomy is given by *Ampelodesmos mauritanicus* whose cover values are usually not so high, and, therefore, the open structure of this vegetation favours the growth of two species such as *Klasea cichoracea* and *Seseli tortuosum,* quite rare in Sicily.

SYNDYNAMISM – It is dynamically connected with the degradation of thermophilous oak-woods, chiefly represented by the *Oleo-Quercetum virgilianae*.

Galio aetnici-Ampelodesmetum mauritanici Minissale 1995 (Table 8)

CHARACTERISTIC SPECIES: *Galium aetnicum*.

DISTRIBUTION – Southern Italy and Sicily.

DISTRIBUTION IN SICILY – North-eastern Sicily (Peloritani Range).

STRUCTURE AND ECOLOGY – Acidophilous association colonizing arenaceous or siliceous substrates with different metamorphism degree. It occurs from the sea level up to 800 m of altitude, within the thermo- and mesomediterranean subhumid bioclimatic belt. The physiognomy is given by *Ampelodesmos mauritanicus* usually showing an homogeneous and dense coverage, where the key species of the association, *Galium aetnicum*, has its optimum.

SYNDYNAMISM – This plant community is strictly linked to the degradation of acidophilous woodlands belonging to *Erico-Quercetum virgilianae*. Intermediate stages among woody communities and dry grasslands are represented by shrubby coenoses dominated by *Calicotome infesta* and *Cistus* sp. pl.

Astragalo huetii-Ampelodesmetum mauritanici Minissale 1995 (Table 8, 10)

CHARACTERISTIC SPECIES: *Astragalus huetii, Cardopatum corymbosum*.

DISTRIBUTION – Endemic of Sicily.

DISTRIBUTION IN SICILY – Western and southern Sicily.

STRUCTURE AND ECOLOGY – This association is linked to particularly xeric habitats, since it finds its ideal ecological conditions within the thermomediterranean dry bioclimatic belt. Its growing sites are typically represented by gently sloping stands characterized by rather primitive soils, rich in skeleton, deriving from carbonatic, marly and chalky substrates. Physiognomically, this grassland is characterized always by *Ampelodesmos mauritanicus,* but, since it doesn't form a dense layer, many other hemicryptophytes may also occur. In particular, the rare endemic *Astragalus huetii* seems to find in this habitat really suitable conditions of development.

SYNDYNAMISM – This grassland is dynamically connected with the degradation series of *Quercetalia calliprini*, as in particular the *Chamaeropo-Quercetum calliprini* or, more rarely and in inland stands, the *Oleo-Quercetum virgilianae*.

Astragalo monspessulani-Ampelodesmetum mauritanici Minissale 1995 (Table 8)

CHARACTERISTIC SPECIES: *Astragalus monspessulanus*.

DISTRIBUTION – Southern Italy and Sicily.

DISTRIBUTION IN SICILY – North-eastern Sicily (Nebrodi).

STRUCTURE AND ECOLOGY – The association occurs from the sea level up to 1000 m of altitude, on acid substrates (mainly flysch) within the mesomediter-

ranean subhumid-humid bioclimatic belt. This community dominated by *Ampelodesmos* mauritanicus shows a certain mesophily, as emphasized floristically by the occurrence of *Astragalus monspessulanus,* hemicryptophyte quite rare in Sicily, which is localized always in mountain places.

SYNDYNAMISM – This grassland is linked to the degradation processes of woodlands referable to *Genisto aristatae-Quercetum suberis* and *Erico-Quercetum virgilianae*. Intermediate regressive stages are chiefly represented by shrubby communities with *Erica arborea* and *Calicotome infesta.*

Arrhenathero nebrodensis-Helictotrichetum convoluti Brullo, Scelsi, Siracusa & Tomaselli 1998 (Table 8)

CHARACTERISTIC SPECIES: *Helictotrichon convolutum, Arrhenatherum nebrodense, Brachypodium rupestre, Festuca rubra.*

DISTRIBUTION – Endemic of Sicily.

DISTRIBUTION IN SICILY – Mt. Lauro (Hyblaean Plateau)

STRUCTURE AND ECOLOGY – This association is localzed on the cacuminal stands of the Hyblaean Plateaux (about 900 n a.s.l.). It grows on Pliocene volcanic rocks with stony and strongly eroded soils. It has its optimum within the supramediterranean umid bioclimatic belt. The structure and physiognomy of this vegetation are given by several caespitose grasses, such as *Helictotrichon convolutum* (dominant)*, Arrhenatherum nebrodense, Brachypodium rupestre,* and *Festuca rubra.*

SYNDYNAMISM – This community seems linked to the degradation of mountain woodlands. In particular, it is likely that the climatophilous vegetation of this area were represented by deciduous woods dominated by *Quercus cerris*, which are nowadays almost definitely disappeared (see Brullo *et al.*, 1998).

Avenulo cincinnatae-Brachypodietum phoenicoidis Brullo, Minissale & Spampinato ass. nov. (Table 8, 11)

HOLOTYPUS: rel.3, tab.11, hoc loco.

CHARACTERISTIC SPECIES: *Brachypodium phoenicoides.*

DISTRIBUTION – Endemic of Sicily.

DISTRIBUTION IN SICILY – Madonie near Gangi.

STRUCTURE AND ECOLOGY – The association exclusively found in the north-facing slopes of the Madonie range within the mesomediterranean humid bioclimatic belt (altitudinal range: 900-1000 m a.s.l.). It colonizes carbonatic steep slopes characterized by brown soils with a fairly good accumulation of fine particles and organic matter. The physiognomy of this community is given by *Brachypodium phoenicoides*, species quite rare in Sicily and reaching here really high cover values. Other caespitose hemicryptophytes, such as *Avenula cincinnata, Dactylis hispanica,* etc., are frequent and abundant too.

SYNDYNAMISM – This grassland is strictly linked to the degradation processes of mesophilous woodlands, such as the *Aceri campestris-Quercetum ilicis*.

Avenulo cincinnatae-Stipetum siculae Brullo, Minissale & Spampinato ass. nov.

CHARACTERISTIC SPECIES: *Stipa sicula.*

HOLOTYPUS: rel.6, tab.12, hoc loco.

matthioletosum fruticulosae Brullo, Minissale & Spampinato subass. nov. (Table 8, 12A)

HOLOTYPUS: rel.6, tab.12, hoc loco.

CHARACTERISTIC SPECIES: *Matthiola fruticulosa* subsp. *fruticulosa, Koeleria splendens* subsp. *splendens.*

DISTRIBUTION – Endemic of Sicily.

DISTRIBUTION IN SICILY – Madonie near Gangi.

STRUCTURE AND ECOLOGY – This vegetation represents the typical aspect of the association and it is linked to microclimatic conditions of windy and exposed calcareous rocky stands with very primitive soils. In fact, it was found only on mountain ridges or flattened plateaux, within the mesomediterranean humid bioclimatic belt between 700 and 900 m of altitude. In this grassland *Ampelodesmos mauritanicus*

plays a secondary role with respect to other grasses, such as *Avenula cincinnata,* species with a central Mediterranean distribution, and *Stipa sicula*, rare Sicilian endemism whose occurrence confirms the ecological requirements of this community.

SYNDYNAMISM – This subassociation is linked to the dynamic series of mesophilous woody vegetation of *Quercetea ilicis*, especially to the *Aceri campestri-Quercetum ilicis*.

hyparrhenietosum hirtae Brullo, Minissale & Spampinato subass. nov. (Table 8, 12B)

HOLOTYPUS: rel.12, tab.12, hoc loco.

CHARACTERISTIC SPECIES: *Hyparrhenia hirta.*

DISTRIBUTION – Endemic of Sicily.

DISTRIBUTION IN SICILY – Central Sicily near Leonforte.

STRUCTURE AND ECOLOGY – This subassociation replaces the typical aspect at lower altitudes in the more xeric conditions, within the mesomediterranean subhumid bioclimatic belt. In fact, this grassland is characterized by a pool of thermo-xerophilous species of the *Hyparrhenietalia hirtae* (*Cachrys libanotis, Hyparrhenia hirta, Phagnalon saxatile, Andropogon distachyos*, etc.) absolutely lacking in the typical subassociation.

SYNDYNAMISM – This vegetation replaces the *Helictotricho convoluti-Ampelodesmetum mauritanici* on more windy and exposed stands.

Avenulo cincinnatae-Stipetum barbatae Brullo, Giusso & Scuderi ass. nov. (Table 8, 13)

HOLOTYPUS: rel.3, tab.13, hoc loco.

CHARACTERISTIC SPECIES: *Stipa barbata.*

DISTRIBUTION – Endemic of Sicily.

DISTRIBUTION IN SICILY – Western Sicily.

STRUCTURE AND ECOLOGY – It is a mesophilous association exclusively localized in inland mountain ridges. This plant community finds its optimal ecological conditions in particularly windy and rocky slopes, within the mesomediterranean subhumid-humid bioclimatic belt (altitudinal range: 700-1000 m a.s.l.). Floristically characterized by the occurrence of *Stipa barbata* (dominant), and *Avenula cincinnata,* while less frequent is *Ampelodesmos mauritanicus.* A pool of orophilous species belonging to the class *Rumici-Astragaletea siculi* testifies the mesophilous character of this association.

SYNDYNAMISM – This association is chiefly found in primary stands, in contact with the dwarf shrubby communities of the *Cerastio-Astragalion nebrodensis.* Deletion of woody vegetation of *Quercetea ilicis* creates suitable environments for the establishment of this coenosis.

THERO-BRACHYPODION RAMOSI Br.-Bl. 1925

SYN.: *Phlomido lychniditis-Brachypodion retusi* Rivas-Martínez ex Mateo 1983 nom. illeg. (art.22); *Scabioso turolensis-Brachypodion retusi* Rossellò 1994 nom. illeg. (art.22).

CHARACTERISTIC SPECIES: *Brachypodium retusum.*

DISTRIBUTION – Mediterranean region (Braun-Blanquet, 1925; Bolòs & Bolòs, 1950; Brullo *et al.*, 2006)

STRUCTURE AND ECOLOGY – This alliance groups thermo-xerophilous grasslands which are localized on different substrates and characterized by the dominance of *Brachypodium retusum*. They are typical pioneer communities, chiefly growing in more or less rocky habitats with incoherent substrata.

SYNDYNAMISM – The associations of this alliance fall within the dynamic series of the *Quercetea ilicis* woodlands. They are typically circumscribed in the clearings of shrubby communities, garigues or more mature grasslands.

Pulicario odorae-Brachypodietum ramosi Ferro & Ladero 1999 (Table 14)

CHARACTERISTIC SPECIES: *Pulicaria odora.*

DISTRIBUTION – Known only for Sicily.

DISTRIBUTION IN SICILY – Aeolian Archipelago.

STRUCTURE AND ECOLOGY – This association colo-

nizes volcanic substrates, with siliceous primitive soils, on flat or gently sloping stands. It was found from the sea level up to 600 m of altitude, within the thermomediterranean subhumid bioclimatic belt (Ferro & Ladero-Alvarez, 1999). The physiognomy of this association is given by *Brachypodium retusum,* while the key species is *Pulicaria odora*, coming from the neighbouring shrubby and woodlands.

SYNDYNAMISM – The association is linked to the degradation processes of maquis or Holm oak woods of *Erico-Quercion ilicis*. Abandoned fields since a long time seem to be very suitable for the establishment of this vegetation, whose evolution is possible only if human disturbance decreases. In fact, when this happens, this association shifts towards shrubby communities with *Artemisia arborescens*, at low altitudes, or maquis at higher altitudes.

Helminthotheco aculeatae-Brachypodietum retusi C. & S. Brullo, Giusso & Tomaselli 2006 (Table 14, 15B)

CHARACTERISTIC SPECIES: *Helminthotheca aculeata, Allium lehmannii*.

DISTRIBUTION – Endemic of Sicily.

DISTRIBUTION IN SICILY – North-western Sicily (coastal mountains between Palermo and Trapani).

STRUCTURE AND ECOLOGY – This association is usually found on rocky slopes and more or less stabilized screes localized at the base of carbonatic cliffs. It represents a floristically poor community where the dominant species, *Brachypodium retusum*, usually reaches high cover values, forming an homogeneous and dense grassland. This communities has its optimum within the thermomediterranean dry bioclimatic belt, even if it usually develops on shady and sheltered stands where the microclimatic conditions are definitely more mesic. The key species of the association are *Helminthotheca aculeata*, thermophilous S Mediterranean species, and *Allium lehmannii*, Sicilian endemic.

SYNDYNAMISM – The plant community is dynamically connected with the climatophilous series of Holm oak woods ascribed to the *Rhamno alterni-Quercetum ilicis*.

Coronillo glaucae-Brachypodietum retusi C. & S. Brullo, Giusso & Tomaselli 2006 (Table 14, 15A)

CHARACTERISTIC SPECIES: *Coronilla valentina* subsp. *glauca*, *Phagnalon viride*.

DISTRIBUTION – Hitherto known only from Sicily.

DISTRIBUTION IN SICILY – Marettimo (Egadi Archipelago).

STRUCTURE AND ECOLOGY – This association grows on Mesozoic limestones with heavily eroded soils characterized by the occurrence of several rocky outcrops. It usually colonizes north-facing and rather steep slopes within the thermomediterranean dry bioclimatic belt. The physiognomy of this grassland is always given by *Brachypodium retusum,* whose cover values are constantly high, but also by two small shrubs (*Coronilla valentina* subsp. *glauca* and *Phagnalon viride*), which floristically differentiate this vegetation.

SYNDYNAMISM – Pioneer plant community dynamically linked with the degradation of *Erico-Micromerietum fruticulosae* Brullo & Marcenò 1983, garigues of the *Cisto-Micromerietea*.

Diantho graminifoli-Brachypodietum retusi Brullo, Giusso & Scuderi ass. nova (Table 14, 15C)

HOLOTYPUS: rel.6, tab.15, hoc loco.

CHARACTERISTIC SPECIES: *Dianthus graminifolius*.

DISTRIBUTION – Endemic of Sicily.

DISTRIBUTION IN SICILY – North-western Sicily (Trapani).

STRUCTURE AND ECOLOGY – The association grows on more or less sloping stands with carbonatic substrates characterized by initial and eroded soils. It usually prefers north-facing slopes covered by debris mixed to rocky outcrops, within the thermomediterranean subhumid bioclimatic belt. This community, dominated by *Brachypodium retusum,* is floristically differentiated by *Dianthus graminifolius,* Si-

cilian endemism widespread in the thermophilous grasslands.

SYNDYNAMISM – This community represents a serial stage, dynamically connected with the *Cisto-Ericion* garigues.

Cachryo siculae-Brachypodietum retusi Brullo, Giusso & Scuderi ass. nova (Table 14, 15D)

HOLOTYPUS: rel.19, tab.15, hoc loco.

CHARACTERISTIC SPECIES: *Cachrys sicula.*

DISTRIBUTION – Hitherto known only for Sicily.

DISTRIBUTION IN SICILY – North-western Sicily.

STRUCTURE AND ECOLOGY – This association is usually localized on stabilized screes or even on rocky stands with soils rich skeleton and coarse carbonatic stones. It is prevalently localized on coastal habitats or, sometimes, on hilly stands within the thermomediterranean dry or subhumid bioclimatic belt. *Cachrys sicula,* spread in the western Mediterranean area, is the differential species of this plant community dominated by *Brachypodium retusum.*

SYNDYNAMISM – It is a secondary vegetation mixed with the grasslands of *Ampelodesmos mauritanicus*, which occurs exclusively in rocky stands ecologically not suitable for the latter community.

BROMO-ORYZOPSION MILIACEAE O.Bolòs 1970

CHARACTERISTIC SPECIES: *Piptatherum miliaceum* subsp. *miliaceum, Dittrichia viscosa, Lepidium graminifolium, Plumbago europaea.*

DISTRIBUTION – Western Mediterranean.

STRUCTURE AND ECOLOGY – This alliance groups nitrophilous perennial communities dominated by big hemicryptophytes, such as *Piptatherum miliaceum* subsp. *miliaceum* and *Dittrichia viscosa,* whose ideal ecological conditions are typically found in abandoned fields, uncultivated ruderal areas or roadsides within the thermomediterranean bioclimatic belt or sometimes within the mesomediterranean one.

SYNDYNAMISM – The purely pioneer associations of this alliance are widely spread all over the island. Actually, the alliance *Bromo-Oryzopsion* seems to have its highest diversity and richness right in Sicily when compared with other Mediterranean territories with similar climatic conditions. This is probably due to the really intensive and long-lasting agro-pastoral use that characterizes this Island since many thousands years. The associations included in this alliance are dynamically connected with different vegetation types, chiefly depending on the habitat where they develop. In particular, it succeeds to the therophytic subnitrophilous vegetation of *Echio plantaginei-Galactition tomentosae* present in abandoned fields, while, along roadsides and footpaths, it replaces plant communities belonging to the *Hordeion leporini*. When human disturbance decreases, the anthropogenic vegetation of *Bromo-Oryzopsion miliaceae* is usually replaced by less nitrophilous dry grasslands of the *Lygeo-Stipetea* class.

NOTES – The syntaxonomical treatment of this alliance is quite controversial. At first, Bolòs (1970) proposed to include the *Bromo-Oryzopsion miliaceae* into the *Chenopodietalia,* afterwards Bolòs & Vigo (1972) and Bolòs (1975) suggested to include it into the *Thero-Brometalia* Rivas Goday & Rivas-Martínez (1963) 1964 (=*Brometalia rubenti-tectori* Rivas-Martínez & Izco 1977). On the other hand, Izco (1978) emphasized the structural and ecologic similarities between the plant communities of *Bromo-Oryzopsion* and the grasslands of *Dauco-Hyparrhenietalia* (=*Hyparrhenietalia hirtae* Rivas-Martínez 1978). Actually, also Brullo (1984) highlighted that both *Chenopodietalia* and *Brometalia rubenti-tectori* group the annual vegetation linked to more or less nitrophilous conditions. For these reasons, the syntaxonomical arrangement proposed by Costa & Mansanet (1981), that treats *Bromo-Oryzopsion* as an alliance of the order *Hyparrhenietalia hirtae* Rivas-Martínez 1978, sounds as the most appropriate.

More recently, Rivas-Martínez *et al.* (1999; 2001), considering the remarkable synanthropic character of the alliance at issue, suggest to refer it to the

Agropyretalia repentis Oberdorfer, Müller & Görs in Oberdorfer et al. 1967, order of the *Artemisietea vulgaris* Lohmeyer, Preising & R.Tx. ex von Rochow 1951. Afterwards, the same author (Rivas-Martínez *et al.*, 2002) moves the *Bromo-Oryzopsion miliaceae* (sub *Bromo-Piptatherion miliaceae*) to the *Carthamentalia lanati* Brullo in Brullo & Marcenò 1985 which is a ruderal order strictly linked to heavily disturbed habitats. However, both these last proposals are not acceptable since the class *Artemisietea vulgaris* includes plant communities exclusively localized in synanthropic habitats characterized by deep soils with a fairly good water availability. Therefore, the inclusion of the thermo-xerophilous alliance *Bromo-Oryzopsion miliaceae* into *Lygeo-Stipetea* class sounds as the most supported solution from floristic, structural and ecological point of view.

Centrantho rubri-Euphorbietum ceratocarpae Brullo 1984 (Table 16, 17A)

CHARACTERISTIC SPECIES: *Centranthus ruber, Euphorbia ceratocarpa, Jacobaea lycopifolia.*

DISTRIBUTION – Southern Italy and Sicily.

DISTRIBUTION IN SICILY – Widespread all over Sicily.

STRUCTURE AND ECOLOGY – This association usually colonizes roadsides or abandoned fields since a long time. It is localized on different substrata (limestones, marls, vulcanites, clays, etc.), within the thermomediterranean dry-subhumid bioclimatic belt. It was found also at higher altitudes (about 500-600m a.s.l.) under the mesomediterranean thermotype. This coenosis is physiognomically characterized by big shrubs of *Euphorbia ceratocarpa* and, sometimes, *Jacobaea lycopifolia*, both endemic of Sicily with isolated outposts in southern Italy. The pioneer species *Centranthus ruber* may also occur with rather high cover values.

SYNDYNAMISM – This showy community represents one of the first stage of the re-colonization processes of abandoned fields which are chiefly located in areas whose potential vegetation is represented by climatophilous coenoses of *Quercetalia ilicis* or *Quercetalia calliprini*. Roadsides are habitats characterized by a persisting human disturbance, therefore the evolution of this community towards more mature coenoses is definitely hampered.

Thapsio garganicae-Feruletum communis Brullo 1984 (Table 16)

CHARACTERISTIC SPECIES: *Thapsia garganica, Ferula communis*, *Opoponax chironium.*

DISTRIBUTION – Central Mediterranean.

DISTRIBUTION IN SICILY – Widespread all over Sicily.

STRUCTURE AND ECOLOGY – This plant community mostly found in coastal habitats within the thermomediterranean bioclimatic belt. It doesn't seem to be linked to any particular substrate, and may also occur on inner stands characterized by more mesic climate conditions and eroded soils. It is widely spread in synanthropic or semi-natural habitats, such as roadsides, old abandoned fields, and over-grazed pastures. This community is physiognomically characterized by the dominance of huge perennial umbellifers, such as *Ferula communis, Thapsia garganica* and *Opoponax chironium*.

SYNDYNAMISM – This association is chiefly found in areas potentially colonized by climatophilous woody vegetation of *Quercetalia ilicis* or *Quercetalia calliprini*. Over-grazing and frequent fires may have an important role in keeping permanent this coenosis.

Dauco maximi-Oryzopsietum miliaceae O. Bolòs 1975 (Table 16, 18B)

CHARACTERISTIC SPECIES: *Daucus carota* subsp. *maximus.*

DISTRIBUTION – Iberian Peninsula, southern Calabria and Sicily (Brullo *et al.*, 2001).

DISTRIBUTION IN SICILY – Widespread all over Sicily.

STRUCTURE AND ECOLOGY – Thermo-xerophilous association growing on different substrates (clays, marls, calcarenites, vulcanites, etc.) characterized by a remarkable edaphic aridity. It is usually found along roadsides or, more rarely, in abandoned fields

within the thermomediterranean dry belt. The physiognomy of this coenosis is given by *Piptatherum miliaceum susp. miliaceum* and *Daucus carota* subsp. *maximus,* usually reaching in such situations high cover values.

SYNDYNAMISM – Secondary plant community linked to heavily ruderalized stands, whose potential vegetation is represented by *Oleo-Ceratonion* maquis.

Diplotaxio tenuifoliae-Oryzopsietum miliaceae Brullo 1984 (Table 16, 17B)

CHARACTERISTIC SPECIES: *Diplotaxis tenuifolia.*

DISTRIBUTION – Hitherto known only from the central Mediterranean area, as southern Calabria, Sicily, and Pantelleria (Brullo, 1984; Brullo *et al.*, 2001).

DISTRIBUTION IN SICILY – Widespread all over Sicily.

STRUCTURE AND ECOLOGY – This association is usually localized in road habitats within the thermomediterranean dry to subhumid bioclimatic belt. It grows on many different substrates characterized by soils with a fairly good accumulation of fine particles and organic matter. Physiognomically, it is characterized by the dominance of *Piptatherum miliaceum* subsp. *miliaceum* and *Diplotaxis tenuifolia*.

SYNDYNAMISM – It is an anthropogenic vegetation whose remarkable pioneer character allows to become a permanent coenosis of constantly disturbed habitats.

Sinapio pubescentis-Oryzopsietum miliaceae Brullo 1984 (Table 16, 17C)

CHARACTERISTIC SPECIES: *Sinapis pubescens.*

DISTRIBUTION – Hitherto known only for Sicily.

DISTRIBUTION IN SICILY – Eastern Sicily (Hyblaean Plateau and Peloritani range).

STRUCTURE AND ECOLOGY – This association was exclusively found on siliceous substrates (vulcanites, schists and gneiss) between 400 and 800 m a.s.l., within the mesomediterranean subhumid bioclimatic belt. This coenosis, chiefly growing along roadsides, is physiognomically differentiated by the occurrence of *Piptatherum miliaceum susp. miliaceum* mixed to *Sinapis pubescens,* with often rather high cover values.

SYNDYNAMISM – Permanent pioneer community linked to habitats constantly disturbed by human impacts. It grows in stands whose potential vegetation is represented by climatophilous woodlands of *Erico-Quercion ilicis.*

Tricholaeno teneriffae-Oryzopsietum miliaceae Brullo 1984 (Table 16)

CHARACTERISTIC SPECIES: *Tricholaena teneriffae.*

DISTRIBUTION – Southern Calabria and north-western Sicily (Brullo, 1984; Brullo *et al.*, 2001)

DISTRIBUTION IN SICILY – Known only from Messina.

STRUCTURE AND ECOLOGY – This community is typically found along roadsides or in abandoned fields characterized by incoherent substrates with arenaceous sandy soils. It is linked to really xeric conditions, so much so that is exclusively found in coastal sites within the thermomediterranean dry bioclimatic belt. The occurrence of *Tricholaena teneriffae*, thermo-xerophilous species (known in Italy just for the areas of Messina and Reggio Calabria), testifies the remarkable aridity to which this coenosis is linked.

SYNDYNAMISM – Like most of the communities of *Bromo-Oryzopsion*, also the *Tricholaeno-Oryzopsietum miliaceae* represents a permanent coenosis developing in areas potentially colonized by shrubby communities of *Oleo-Ceratonion.*

Euphorbietum cupanii Brullo 1984 (Table 16)

CHARACTERISTIC SPECIES: *Euphorbia cupani.*

DISTRIBUTION – Hitherto known only for western Sicily, but, on the basis of personal field investigations, it occurs also in Sardinia.

DISTRIBUTION IN SICILY – Western Sicily (Trapani).

STRUCTURE AND ECOLOGY – This plant community grows only in coastal habitats within the thermo-

mediterranean dry bioclimatic belt. It is quite rare and circumscribed to heavily disturbed stands (roads, paths, etc.) with marly or loamy soils. The key species of this association is *Euphorbia cupani* which is a small chamaephyte widely spread in Sardinia, while in Sicily occurs only in a really circumscribed area.

SYNDYNAMISM – Permanent community having its optimum in areas where the potential vegetation is represented by thermo-xerophilous maquis of *Oleo-Ceratonion*.

Boerhaavio viscosae-Oryzopsietum miliaceae Brullo 1984 (Table 16)

CHARACTERISTIC SPECIES: *Boerhavia repens* subsp. *viscosa*.

DISTRIBUTION – Hitherto known only for Sicily.

DISTRIBUTION IN SICILY – Palermo (Brullo, 1984; Gianguzzi *et al.*, 1996).

STRUCTURE AND ECOLOGY – Nitrophilous plant community linked to heavily disturbed and sunny stands usually localized near the sea. This association colonizes roadsides with very primitive soils within the thermomediterranean dry bioclimatic belt. It chiefly develops on carbonatic substrates and the physiognomy is given by *Boerhavia repens* subsp. *viscosa,* naturalized exotic species.

SYNDYNAMISM – This association develops where the potential vegetation is represented by coastal maquis of *Oleo-Ceratonion*.

Dittrichio viscosae-Ferulaginetum campestris Brullo 1984 (Table 16)

CHARACTERISTIC SPECIES: *Ferulago campestris*.

DISTRIBUTION – Hitherto known only from Sicily.

DISTRIBUTION IN SICILY – Northern Sicily (Madonie and Nebrodi).

STRUCTURE AND ECOLOGY – This is the more mesophilous association of the alliance, and it is chiefly found on carbonatic substrates between 800 and 1200 m a.s.l. It usually grows on slightly less disturbed stands, near roads or paths, within meso-supramediterranean subhumid bioclimatic belt. Key species of the association is *Ferulago campestris*, big hemicryptophyte quite rare in Sicily even if linked to synanthropic habitats.

SYNDYNAMISM – This association occurs in stands whose potential vegetation is represented by mesophilous oak woods of *Quercetalia ilicis*.

Mantisalco salmanticae-Oryzopsietum miliaceae Bartolo, Brullo, Minissale & Spampinato 1990 (Table 16)

CHARACTERISTIC SPECIES: *Mantisalca salmantica, Daucus siculus*.

DISTRIBUTION – Endemic of Sicily.

DISTRIBUTION IN SICILY – Lampedusa (Pelagian Archipelago).

STRUCTURE AND ECOLOGY – This association is normally localized in abandoned fields or ruderal areas within the inframediterranean dry bioclimatic belt. The remarkable aridity of Lampedusa causes very unsuitable conditions for the establishment of this coenosis, and, therefore, it is circumscribed to stands where the microclimatic conditions are usually less unfavourable to its development. In fact, this community usually grows near abandoned buildings and stone-walls, habitats more sheltered from intense winds. From the floristic viewpoint this association is characterized by the occurrence of *Mantisalca salmantica,* North African species, and *Daucus siculus,* endemic of Sicily, growing together with *Piptatherum miliaceum* subsp. *miliaceaum*.

SYNDYNAMISM – Association dynamically linked to the thermo-xerophilous maquis of *Periploco-Euphorbietum dendroidis*.

Lathyro sphaerici-Oryzopsietum miliaceae Brullo & Siracusa 1996 (Table 16)

CHARACTERISTIC SPECIES: *Lathyrus sphaericus, Vicia benghalensis*.

DISTRIBUTION – Known only for Sicily.

DISTRIBUTION IN SICILY – Linosa (Pelagian Archipelago).

STRUCTURE AND ECOLOGY – This association, growing on volcanic substrates, is exclusively localized on shady and sheltered stands. Its localization in these habitats is chiefly due to the harsh environmental conditions of Linosa. In fact, the islet falls within the inframediterranean dry belt, where the climatic conditions are so severe to force this coenosis in finding refuge stands for ensure its own surviving. The key species, *Lathyrus sphaericus* and *Vicia benghalensis,* are quite rare in the islet and floristically differentiate this coenosis dominated by *Piptatherum miliaceum* subsp. *miliaceaum*.

SYNDYNAMISM – Association dynamically linked to the thermo-xerophilous maquis of *Periploco-Euphorbietum dendroidis*.

Centauretum sonchifoliae Brullo & Siracusa ass. nov. (Table 16, 18A)

HOLOTYPUS: rel.1, tab.18, hoc loco.

CHARACTERISTIC SPECIES: *Centaurea sonchifolia*.

DISTRIBUTION – Hitherto known only for Sicily.

DISTRIBUTION IN SICILY – Catania (coastal stands).

STRUCTURE AND ECOLOGY – This association was exclusively found on rocky coastal habitats near urbanized areas. Nitrophilous coenosis growing on volcanic substrates characterized by halomorphic soils and having its ideal ecological conditions within the thermomediterranean subhumid bioclimatic belt. The physiognomy of this community is given by *Centaurea sonchifolia,* species quite rare in Sicily having its optimum right in these disturbed environments.

SYNDYNAMISM – This association is dynamically connected with the halo-nitrophilous communities of *Pegano-Salsoletea,* which are usually replaced when human disturbance increases.

ARUNDION COLLINAE Brullo, Giusso, Guarino & Sciandrello all. nov.

HOLOTYPUS: *Euphorbio ceratocarpae-Arundinetum collinae* ass. nov., hoc loco.

CHARACTERISTIC SPECIES: *Arundo collina*.

DISTRIBUTION – Italy, Sicily, Greece and Crete.

STRUCTURE AND ECOLOGY – This alliance groups thermophilous plant communities growing on clayey stands, chiefly characterized by deep soils with a fairly good water content for most of the year. The characteristic species of this alliance is *Arundo collina*, which has its maximum spread and development in these peculiar habitats. In fact, this big rhizomatous hemicryptophyte seems to be really well adapted to synanthropic or human disturbed sites.

SYNDYNAMISM – In this alliance are included plant communities exclusively localized in peculiar and ecologically specialized habitats. They usually dwell an intermediate position among the nitrophilous perennial dry grasslands of *Hyparrhenietalia hirtae*, especially those belonging to the *Bromo-Oryzopsion,* and the xerophilous coenosis found on badlands (*Moricandio-Lygeion sparti*).

NOTES – The proposal of this new alliance is based on the low floristic-structural and ecological affinities among the *Arundo collina*-dominated coenoses and any other known syntaxon of the class *Lygeo-Stipetea*. In addition, this syntaxonomical arrangement is well supported by the cluster analysis (Fig.1), in which is clear the segregation of such communities from the *Hyparrhenietalia hirtae* and *Lygeo-Stipetalia*. This is a further evidence of the peculiarity and originality of the coenoses dominated by *A. collina* which, therefore, should deserve more investigations especially in Italy and Greece. For this reason, we suggest to include provisionally the alliance at issue in the *Hyparrhenietalia hirtae* which is the order floristically more similar.

Euphorbio ceratocarpae-Arundinetum collinae Brullo, Giusso, Guarino & Sciandrello ass. nov. (Table 19)

HOLOTYPUS: rel.9, tab.19, hoc loco.

CHARACTERISTIC SPECIES: *Euphorbia ceratocarpa*.

DISTRIBUTION – Southern Italy and Sicily.

DISTRIBUTION IN SICILY – Widespread all over Sicily.

STRUCTURE AND ECOLOGY – This association is typically found on small hollows and more or less steep slopes, characterized by deep clayey substrates. It has ideal ecologic conditions within the thermo- and mesomediterranean dry-subhumid bioclimatic belt, but it tolerates quite well summer drought. This plant community, floristically quite poor, is characterized by *Euphorbia ceratocarpa*, endemic species of southern Italy and Sicily, while the species physiognomically dominant is *Arundo collina* (=*A.plinii* auct. sic.) which usually reaches high cover values. This sub-hygrophilous coenosis is quite common in Sicily, especially in synanthropic environments, such as abandoned fields, roadsides, and quarries.

SYNDYNAMISM – Permanent association dynamically connected with the synanthropic vegetation of *Echio-Galactition* and *Bromo-Oryzopsion*.

NOTES – Another association dominated by *Arundo collina* was described by Brullo *et al.* (2001) for southern Calabria, sub *Arundi plinii-Oryzopsietum thomasii*. This association is ecologically quite similar to the *Euphorbio ceratocarpae-Arundinetum collinae,* but according to art. 43 of the ICPN (Weber *et al.*, 2000) the name of this association should be modified in *Arundo collinae-Oryzopsietum thomasii* Brullo, Scelsi & Spampinato 2001 corr.

LYGEO-STIPETALIA (Br.-Bl.& O.Bolòs 1958) Rivas Martinez 1978

SYN.: *Thero-Brachypodietalia* Br.-Bl. ex Bharucha 1933 nom. amb. (art. 36)

CHARACTERISTIC SPECIES: *Lygeum spartum*.

DISTRIBUTION – Mediterranean region (Brullo *et al.*, 2002a).

STRUCTURE AND ECOLOGY – This order groups plant communities dominated by *Lygeum spartum* and ecologically selected by the tolerance to marked thermo-xeric climatic conditions, even increased by soil badness mainly represented by clayey, heavily eroded substrates. These coenoses can be found from the sea level up to about 900 m a.s.l. within the thermo- and mesomediterranean dry to subhumid bioclimatic belt.

SYNDYNAMISM – The edapho-xerophilous associations included in this order are usually in contact with the halo-nitrophilous communities of *Pegano-Salsoletea*, while, on less steep stands where the soil evolution is not hampered, they are dynamically connected with maquis of *Oleo-Ceratonion*.

MORICANDIO ARVENSIS-LYGEION SPARTI Brullo, De Marco & Signorello 1990

CHARACTERISTIC SPECIES: *Eryngium dichotomum, E. triquetrum, Moricandia arvensis, Capparis sicula*.

DISTRIBUTION – Southern Calabria, Sicily and Sardinia (Brullo *et al.*, 1990; 2002a).

STRUCTURE AND ECOLOGY – *Lygeum*-dominated grasslands occurring in the central Mediterranean territories are included in this alliance. These communities are usually circumscribed to steep slopes of badlands, strongly affected by water erosion. The occurrence of a pool of endemic species, ecologically really specialized, gives a peculiar floristic characterization to this alliance.

SYNDYNAMISM – The associations of this alliance can be considered as edapho-xerophilous communities, strictly linked to such peculiar environments where soil evolution is hampered.

NOTES – Gentile & Di Benedetto (1961) firstly suggested to include the dry grassland dominated by *Lygeum spartum* of Sicily and Calabria to an autonomous alliance. Actually, the weak floristic similarities between the Italian communities and those from western Mediterranean territories (included into the *Eremopyro-Lygeion* Br.-Bl. & Bolòs 1958) seem to be enough to support this hypothesis. In fact, Brullo (1985) refers the *Lygeum spartum*-dominated communities of central Mediterranean to a new alliance *Dauco-Catananchion luteae,* chiefly char-

acterized by annual species of *Stipo-Trachynetea dystachiae* Brullo 1985. Afterwards, Brullo *et al.* (1990), highlighting that the perennial wintergreen dry grasslands typically form a mosaic with the therophytic vegetation, describe two new alliances. One includes the *Lygeum*-dominated grasslands developing in less xeric conditions (*Polygonion tenoreani* Brullo *et al.* 1990), while another groups more thermo-xerophilous perennial dry grasslands (*Moricandio-Lygeion sparti* Brullo *et al.* 1990). In particular, as already emphasized by Brullo *et al.* (2002a), the Sicilian phytocoenoses have to be referred to the latter alliance. Biondi & Mossa (1992) described a floristically poor community from southern Sardinia, namely *Phagnalo annotici-Lygeetum sparti*. This association occurs also in Sicily, where the richer floristic settlement allows to include it in the alliance at issue.

Eryngio dichotomi-Lygeetum sparti Gentile & Di Benedetto 1961 *nom. invers. prop.* (Table 20, 21D)

SYN.: *Lygeo-Eryngietum dichotomi* Gentile & Di Benedetto 1961

CHARACTERISTIC SPECIES: *Eryngium dichotomum, E. triquetrum.*

DISTRIBUTION – Endemic of Sicily.

DISTRIBUTION IN SICILY – Central Sicily.

STRUCTURE AND ECOLOGY – Thermo-xerophilous association colonizing gently sloping stands with clayey substrates. This vegetation, occurring within thermomediterranean dry belt (altitudinal range: 0-300 m a.s.l.), is floristically differentiated by *Eryngium dichotomum* and *E. triquetrum,* xerophytes coming from northern Africa, and whose occurrence testifies the really xeric conditions of the dwelled sites.

SYNDYNAMISM – Coenosis in contact with the shrubby vegetation of *Pegano-Salsoletea*.

Phagnalo annotici-Lygeetum sparti Biondi & Mossa 1992 (Table 20, 21A)

CHARACTERISTIC SPECIES: *Asparagus stipularis, Phagnalon rupestre* subsp. *annoticum.*

DISTRIBUTION – Southern Sardinia (Biondi & Mossa, 1992) and southern Sicily (Brullo *et al.*, 2000; Bazan *et al.*, 2006; Giusso *et al.*, 2008).

DISTRIBUTION IN SICILY – Southern Sicily (from Siculiana to Gela).

STRUCTURE AND ECOLOGY – This plant community colonizes coastal badlands, directly affected by marine aerosol. It usually dwells very steep slopes, characterized by clayey substrates, within the thermomediterranean dry bioclimatic belt. This *Lygeum*-dominated coenosis is differentiated by *Asparagus stipularis* and *Phagnalon rupestre* subsp. *annoticum*.

SYNDYNAMISM – Similarly to the other associations belonging to this alliance, also this one represents an edapho-xerophilous community, generally in contact with the shrubby vegetation of *Pegano-Salsoletea*.

Lavatero agrigentinae-Lygeetum sparti Brullo 1985 *nom. invers. prop.* (Table 20, 21B)

SYN.: *Lygeo-Lavateretum agrigentinae* Brullo 1985.

CHARACTERISTIC SPECIES: *Lavatera agrigentina, Allium agrigentinum, Limonium calcarae*.

DISTRIBUTION – Endemic of Sicily.

DISTRIBUTION IN SICILY – Central and southern Sicily.

STRUCTURE AND ECOLOGY – This association usually grows on flat or gently sloping stands, where the dominant species (*Lygeum spartum*) constitutes thick and floristically homogeneous grasslands. This community finds its ideal ecological conditions within the thermo- and mesomediterranean dry-subhumid bioclimatic belt. The occurrence of some rare endemic taxa, such as *Lavatera agrigentina, Allium agrigentinum* and *Limonium calcarae,* gives to this grassland a really peculiar floristic connotation.

SYNDYNAMISM – Edapho-xerophilous association usually growing on wide surfaces, dynamically linked to the shrubby vegetation of *Pegano-Salsoletea*.

Asteretum sorrentini Brullo 1985 (Table 20, 21C)

SYN.: *Asteretum sorrentinii* Raimondo in Venturella *et al.* 1986

CHARACTERISTIC SPECIES: *Tripolium sorrentini.*

DISTRIBUTION – Endemic of Sicily.

DISTRIBUTION IN SICILY – Central and western Sicily.

STRUCTURE AND ECOLOGY – This association colonizes rather steep slopes characterized by clayey substrates within the mesomediterranean subhumid bioclimatic belt (up to 900 m a.s.l.). It may occur also at lower altitudes, within the thermomediterranean thermotype. But the optimal aspects of this mesophilous coenosis are found on submontane stands, where the physiognomy is given by the endemic *Tripolium sorrentini,* whose cover values are definitely low. It should be noted that, in this association, *Lygeum spartum* occurs only sporadically and just few species participate to this association.

SYNDYNAMISM – Pioneer, edaphophilous community occurring within the mesophilous deciduous oak woods of *Quercetalia ilicis*.

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FLORISTIC LIST

Acanthaceae

Acanthus mollis L.

Alliaceae

Allium agrigentinum Brullo & Pavone, *Allium arvense* Guss., *Allium hemisphaericum* (Sommier) Brullo, *Allium lehmannii* Lojac., *Allium pallens* L., *Allium sphaerocephalon* L., *Allium subhirsutum* L.

Amaranthaceae

Achyranthes sicula (L.) All.

Anacardiaceae

Pistacia terebinthus L.

Apiaceae

Ammi visnaga (L.) Lam., *Cachrys libanotis* L., *Cachrys pungens* Jan ex Guss., *Cachrys sicula* L., *Daucus carota* L. subsp. *carota*, *Daucus carota* L. subsp. *maximus* (Lam.) Batt. in Batt. & Trab., *Daucus gingidium* L., *Daucus siculus* Tineo, *Echinophora tenuifolia* L., *Elaeoselinum meoides* W.D.J.Koch ex DC., *Eryngium bocconei* Lam., *Eryngium campestre* L., *Eryngium crinitum* Presl, *Eryngium dichotomum* Desf., *Eryngium triquetrum* Vahl, *Ferula communis* L., *Ferulago campestris* (Besser) Grecescu, *Ferulago nodosa* Boiss., *Foeniculum piperitum* C.Presl, *Foeniculum vulgare* Mill., *Kundmannia sicula* (L.) DC., *Magydaris pastinacea* (Lam.) Paol., *Opoponax chironium* (L.) W.D.J. Koch, *Pimpinella anisoides* Briganti, *Seseli tortuosum* L. var. *tortuosum, Thapsia garganica* L., *Thapsia pelagica* Brullo, Guglielmo, Pasta, Pavone & Salmeri

Araceae

Arisarum vulgare Targ.-Tozz.

Arecaceae

Chamaerops humilis L.

Asparagaceae

Asparagus acutifolius L., *Asparagus albus* L., *Asparagus stipularis* Forrsk.

Asphodelaceae

Asphodeline lutea (L.) Rchb., *Asphodelus ramosus* L.

Asteraceae

Achillea ligustica All., *Anthemis lopadusana* Lojac., *Artemisia arborescens* L., *Calendula suffruticosa* Vahl subsp. *fulgida* (Rafin) Ohle, *Cardopatum corymbosum* (L.) Pers., *Carduncellus pinnatus* DC., *Carlina gummifera* Less., *Carlina hispanica* Lam. subsp. *globosa* (Arcang.) Meusel & Kåstner, *Carlina involucrata* Poir., *Carlina sicula* Ten., *Carthamus lanatus* L., *Catananche lutea* L., *Centaurea napifolia* L., *Centaurea nicaeensis* All., *Centaurea parlatoris* Heldr., *Centaurea sonchifolia* L., *Centaurea seguenzae* (Lacaita) Brullo, Marcenò & Siracusa, *Chiliadenus lopadusanus* Brullo, *Chondrilla juncea* L., *Chrysanthemum coronarium* L., *Coleostephus myconis* L., *Conyzanthus squamatus* (Spreng.) Tamamsch., *Crepis bulbosa* Tausch, *Crepis hiemalis* Biv., *Crepis hispida* Waldst. & Kit., *Crepis vesicaria* L., *Crupina crupinastrum* Vis., *Cynara cardunculus* L., *Dittrichia graveolens* Greuter, *Dittrichia viscosa* Greuter, *Galactites elegans* (Nyman) Soldano, *Hedypnois rhagadialoides* (L.) F. W. Schmidt, *Helichrysum hyblaeum* Brullo, *Helichrysum stoechas* (L.) Moench, *Helminthotheca aculeata* (Vahl) Lack, *Helminthotheca echioides* (L.) Holub, *Hyoseris radiata* L., *Hypochoeris achyrophorus* L., *Inula montana* L., *Jacobaea lycopifolia* (Poir.) Greuter & E. Nord., *Klasea cichoriacea* (L.) Webb, *Klasea flavescens* (L.) Holub subsp. *mucronata* (Desf.) Cantò & Rivas-Mart., *Launea resedifolia* (L.) O. Kuntze, *Leontodon tuberosus* L., *Mantisalca salmantica* (L.) Briq. et Cavill., *Pallenis spinosa* (L.) Cass., *Phagnalon rupestre* (L.) DC. subsp. *annoticum* (Jordan) Pign., *Phagnalon rupestre* (L.) DC. subsp. *Rupestre, Phagnalon saxatile* (L.) Cass., *Podospermum canum* C.A. Meyer, *Podospermum laciniatum* (L.) DC., *Pulicaria odora* (L.) Rchb., *Reichardia picroides* (L.) Roth., *Scolymus grandiflorus* Desf., *Scolymus hispanicus* L., *Scorzonera columnae* Guss., *Scorzonera deliciosa* Guss., *Scorzonera hirsuta* L., *Senecio delphinifolius* Vahl, *Sonchus asper* (L.) Hill, *Sonchus oleraceus* L., *Tolpis virgata* Bertol., *Tragopogon porrifolius* L., *Tripolium sorrentinoi* (Tod.) Raimondo & Greuter, *Urospermum dalechampii* (L.) Schmidt

Boraginaceae

Echium italicum L., *Echium plantagineum* L., *Anchusella*

cretica (Mill.) Bigazzi, Nardi et Selvi, *Alkanna tinctoria* Tausch

Brassicacae

Arabis rosea DC., *Biscutella didyma* L., *Biscutella maritima* Ten., *Bonannia graeca* Halácsy, *Brassica fruticulosa* Cyril., *Diplotaxis tenuifolia* (L.) DC., *Erysimum bonannianum* C. Presl, *Erysimum metlesicsii* Polatschek, *Isatis canescens* DC., *Lepidium graminifolium* L., *Lobularia maritima* (L.) Desv., *Matthiola fruticulosa* (L.) Maire subsp. *fruticulosa*, *Moricandia arvensis* (L.) DC., *Sinapis pubescens* L.

Capparidaceae

Capparis sicula Duhamel

Caprifoliaceae

Lonicera implexa Aiton

Caryophyllaceae

Dianthus graminifolius C. Presl, *Dianthus rupicola* Biv., *Gypsophila arrostii* Guss., *Petrorhagia illyrica* (L.) P.W. Ball & Heywood subsp. *haynaldiana* (Janka) P.W. Ball, *Petrorhagia saxifraga* (L.) Link, *Petrorhagia velutina* (Guss.) P. W. Ball & Heywood, *Silene coeli-rosa* (L.) Godron, *Silene gallica* L., *Silene sicula* Ucria, *Silene vulgaris* (Moench) Garcke subsp. *angustifolia* Hayek

Chenopodiaceae

Atriplex halimus L., *Beta maritima* L., *Halimione portulacoides* (L.) Aellen, *Salsola agrigentina* Guss., *Salsola oppositifolia* Desf., *Sueda vera* J.F. Gmelin.

Cistaceae

Cistus creticus L., *Cistus eriocephalus* Viv., *Cistus salviifolius* L., *Fumana thymifolia* (L.) Spach, *Helianthemum cinereum* (Cav.) Pers., *Helianthemum nummularium* (L.) Mill., *Helianthemum salicifolium* (L.) Mill.

Convolvulaceae

Convolvulus althaeoides L., *Convolvulus arvensis* L., *Convolvulus cantabrica* L., *Convolvulus elegantissimus* Mill., *Convolvulus lineatus* L.

Crassulaceae

Sedum album L., *Sedum gypsicola* Boiss. & Reuter, *Sedum sediforme* (Jacq.) Pau, *Sedum tenuifolium* (Sm.) Strobl

Cucurbitaceae

Ecballium elaterium (L.) A. Rich.

Cyperaceae

Carex flacca Schreber subsp. *serrulata* (Biv.) Greuter

Dennstaedtiaceae

Pteridium aquilinum (L.) Kuhn

Dipasaceae

Dipsacus fullonum L., *Scabiosa maritima* L., *Scabiosa atropurpurea* L.

Ericaceae

Erica multiflora L.

Euphorbiaceae

Euphorbia ceratocarpa Ten., *Euphorbia characias* L., *Euphorbia cupanii* Guss., *Euphorbia dendroides* L., *Euphorbia pinea* L., *Euphorbia rigida* M. Bieb., *Euphorbia terracina* L.

Fabaceae

Anthyllis vulneraria L. subsp. *maura* (Beck) Lindb., *Astragalus huetii* Bunge, *Astragalus monspessulanus* L., *Bituminaria bituminosa* (L.) C.H. Stirton, *Calicotome infesta* (C. Presl) Guss., *Coronilla emerus* L., *Coronilla valentina* L. subsp. *glauca* (L.) Batt., *Dorycnium hirsutum* Ser., *Dorycnium rectum* Ser., *Hippocrepis ciliata* Willd., *Hymenocarpus circinnatus* (L.) Savi, *Lathyrus articulatus* L., *Lathyrus sphaericus* Retz., *Lotus cytisoides* L., *Lotus edulis* L., *Lotus ornithopodioides* L., *Medicago minima* (L.) Bartal., *Medicago murex* Willd., *Onobrychis caput-galli* Lam., *Ononis natrix* L. subsp. r*amosisima* (Desf.) Batt., *Ononis pendula* Desf., *Physanthyllis tetraphylla* (L.) Boiss., *Scorpiurus muricatus* L., *Sulla coronaria* (L.) Medik, *Sulla glomerata* (F. Dietr.) B.H. Choi & H. Ohashi, *Trifolium angustifolium* L., *Trifolium arvense* L., *Trifolium campestre* Schreber, *Trifolium cherleri* L., *Trifolium fragiferum* L., *Trifolium scabrum* L., *Trifolium stellatum* L., *Vicia benghalensis* L., *Vicia villosa* Roth.

Gentianaceae

Centaurium erythraea Rafn, *Centaurium tenuiflorum* Druce

Geraniaceae

Erodium laciniatum Willd., *Erodium malacoides* (L.) L'Hèr.

Hyacinthaceae

Bellevalia dubia Rchb., *Charybdis maritima* (L.) Speta, *Leopoldia comosa* Parl., *Loncomelos narbonense* (L.) Rafin., *Muscari atlanticum* Boiss. & Reuter, *Oncostema cerulea* (Raf.) Speta, *Ornithogalum gussonei* Ten.

Hypericaceae

Hypericum perfoliatum L., *Hypericum perforatum* L., *Hypericum triquetrifolium* Turra.

Iridaceae

Gladiolus communis L. subsp. *byzantinus* (Mill.) Douin

Lamiaceae

Ajuga iva (L.) Schreber, *Ajuga pseudoiva* Rob., *Calamintha nepeta* (L.) Savi, *Micromeria fruticulosa* (Bertol.) Grande, *Micromeria consentina* (Ten.) N. Terracc., *Micromeria graeca* (L.) Bentham, *Origanum heracleoticum* L., *Phlomis fruticosa* L., *Phlomis herba-venti* L., *Prasium majus* L., *Salvia verbenaca* L., *Sideritis romana* L., *Stachys ocymastrum* (L.) Briq., *Teucrium capitatum* L., *Teucrium chamaedrys* L., *Teucrium flavum* L., *Teucrium fruticans* L., *Thymbra capitata* (L.) Cav., *Thymus spinulosus* Ten.

Linaceae

Linum bienne Miller, *Linum strictum* L., *Linum trigynum* L.

Malvaceae

Lavatera agrigentina Tineo

Moraceae

Ficus carica L

Nyctaginaceae

Boerhavia repens L. subsp. *viscosa* (Choisy) Maire

Orchidaceae

Anacamptis pyramidalis (L.) L.C. Rich., *Ophrys lutea* Cav., *Orchis italica* Poiret, *Serapias parviflora* Parl.

Orobanchaceae

Orobanche ramosa L. subsp. *muteli* (F.W. Schultz) Coutinho

Papaveraceae

Glaucium flavum Crantz

Plantaginaceae

Plantago coronopus L., *Plantago serraria* L.

Plumbaginaceae

Limoniastrum monopetalum (L.) Boiss., *Limonium calcarae* (Janka) Pign., *Plumbago europaea* L.

Poaceae

Ampelodesmos mauritanicus (Poiret) Dur. et Sch., *Andropogon distachyos* L., *Arrhenatherum nebrodense* Brullo, Minissale & Spampinato, *Arundo collina* Ten., *Arundo donax* L., *Avena barbata* Potter, *Avenula cincinnata* (Ten.) J.Holub, *Bothriochloa panormitana* (Parl.) Brullo, *Brachypodium phoenicoides* (L.) Roem. & Schult., *Brachypodium retusum* (Pers.) Beauv., *Brachypodium rupestre* (Host) Roem. & Schult., *Briza maxima* L., *Bromus diandrus* Roth, *Bromus erectus* Huds., *Bromus hordeaceus* L., *Bromus intermedius* Guss., *Bromus madritensis* L., *Dactylis hispanica* Roth, *Dasypyrum villosum* (L.) Borbàs, *Dichanthium annulatum* (Forssk.) Stapf, *Festuca arundinacea* Schreber, *Festuca caerulescens* Desf., *Festuca circummediterranea* Patzke, *Festuca humifusa* Brullo & Guarino. *Festuca rubra* L., *Haynaldia villosa* Schur, *Helictotrichon convolutum* (C. Presl) Henrard, *Heteropogon contortus* (L.) Beauv., *Hyparrhenia hirta* (L.) Stapf., *Hyparrhenia sinaica* (Delile) Llauradó ex G.López, *Imperata cylindrica* (L.) Beauv., *Koeleria splendens* Presl subsp. *splendens, Lagurus ovatus* L., *Lolium rigidum* Gaudin, *Lygeum spartum* L., *Megathyrsus bivonianus* (Brullo P. Minissale, F. Scelsi, Spamp.) Verloove, *Panicum repens* L., *Parapholis pycnantha* (Hack.) C.E. Hubbard, *Phalaris coerulescens* Desf., *Piptatherum miliaceum* (L.) Coss. subsp. *miliaceum, Piptatherum miliaceum* (L.) Coss. subsp. *pauciflorum* (Bég. & Vacc.) Brullo & Giusso comb. & stat. nov. [Bas: *Oryzopsis pauciflora* Bég. &

Vacc., Ann. Bot (Roma) 12: 94, 1912], *Poa bulbosa* L., *Rostraria litorea* (All.) Holub, *Stipa appendiculata* Celak, *Stipa barbata* Desf., *Stipa capensis* Thunb., *Stipa gussonei* Moraldo, *Stipa sicula* Moraldo, La Valva, Ricciardi & Caputo, *Trachynia distachya* (L.) Link, *Tricholaena teneriffae* (L. fil.) Link, *Trisetum splendens* C. Presl, *Vulpia ciliata* (Danth.) Link.

Polygalaceae

Polygala monspeliaca L.

Polygonaceae

Rumex acetosa L., *Rumex crispus* L., *Rumex pulcher* L. subsp. *woodsii* (De Not.) Arcangeli

Ranunculaceae

Anemone hortensis L., *Delphinium emarginatum* Presl, *Nigella damascena* L., *Ranunculus palustris* L., *Ranunculus rupestris* Guss.

Resedaceae

Reseda alba L.

Rosaceae

Prunus dulcis (Mill.) D.A. Webb, *Pyrus spinosa* Forssk., *Rubus ulmifolius* Schott, *Sanguisorba minor* Scop., *Sanguisorba verrucosa* Ces., *Sarcopoterium spinosum* (L.) Spach

Rubiaceae

Asperula aristata L. subsp. *scabra* (Presl) Nyman, *Galium aetnicum* Bivona, *Galium lucidum* All., *Galium pallidum* C. Presl.

Rutaceae

Ruta chalepensis L.

Santalaceae

Osyris alba L.

Scrophulariaceae

Bellardia trixago (L.) All., *Linaria multicaulis* (L.) Miller, *Linaria purpurea* (L.) Miller, *Parentucellia viscosa* (L.) Caruel, *Scrophularia bicolor* Sibth. & Sm., *Verbascum blattaria* L., *Verbascum sinuatum* L., *Verbascum thapsus* L.

Smilacaceae

Smilax aspera L.

Solanaceae

Nicotiana glauca Graham, *Solanum nigrum* L.

Thymeleaceae

Daphne gnidium L.

Valerianaceae

Centranthus ruber (L.) DC.

Verbenaceae

Verbena officinalis L.

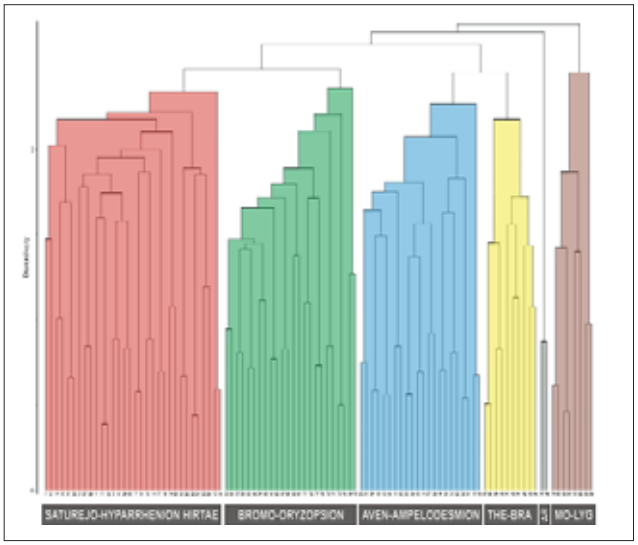

Fig.1 - Cluster diagram of the Sicilian associations ascribed to the Lygeo-Stipetea class (123 species x 98 relevés)

Table 4
Ferulago nodosae-Hyparrhenietum hirtae

Relevé	1	2	3	4	5	6	7	8	9	10	11	12
Altitude (mt a.s.l.)	190	410	410	250	410	415	430	210	260	300	350	160
Plot size (sq.m.)	50	10	50	10	50	40	25	100	100	100	100	50
Cover (%)	100	100	100	100	90	100	100	100	100	100	100	90
Slope (°)	30	10	5	20	10	10	20	45	45	45	30	10
Exposure	NW	S	S	SW	S	SE	E	SW	N	N	W	NW
Char. Association												
Ferulago nodosa	1	+	2	1	2	2	3	4	5	5	4	3
Char. Alliance (*HYPARRHENION HIRTAE*) and Order (*HYPARRHENIETALIA HIRTAE*)												
Hyparrhenia hirta	4	4	3	3	4	5	4	3	2	3	4	3
Micromeria graeca	2	1	1	2	.	1	1	1	2	2	2	2
Foeniculum piperitum	2	3	1	1	1	+	.	+	2	2	1	.
Convolvulus althaeoides	.	1	2	.	+	1	.	+	+	.	.	+
Phagnalon saxatile	.	+	+	.	2	1	2	.	.	.	+	.
Lathyrus articulatus	1	.	+	+	2	1	+	.	.	.	.	.
Andropogon distachyos	.	.	.	.	.	.	.	1	2	2	2	3
Hyoseris radiata	.	.	.	.	.	.	.	+	+	+	.	.
Char. Class (*LYGEO-STIPETEA*)												
Bituminaria bituminosa	.	1	1	3	1	2	1	2	+	+	1	.
Scabiosa maritima	2	1	+	1	1	+	.	+	2	2	1	.
Dactylis hispanica	4	.	+	.	1	2	1	.	3	3	1	1
Asphodelus ramosus	.	2	1	.	1	1	+	+	.	.	+	2
Galium lucidum	.	.	+	.	1	.	1	+	+	+	2	1
Charybdis maritima	+	+	.	.	1	1	2	.	.	.	1	2
Carlina hispanica subsp. *globosa*	.	.	.	+	+	+	+	.	.	.	.	1
Calamintha nepeta	1	1	2	+	.	.	.	.	.	.	.	.
Lobularia maritima	.	.	.	.	+	1	+	.	.	.	.	.
Piptatherum miliaceum subsp. *miliaceum*	+	.	.	1	.	.	+	.	.	.	.	.
Pallenis spinosa	.	.	.	.	.	.	.	.	+	+	+	.
Reichardia picroides	.	.	.	.	.	.	.	.	.	+	+	+
Sanguisorba minor subsp. *verrucosa*	.	.	.	.	.	.	.	.	1	1	+	.
Pimpinella anisoides	.	.	.	.	.	.	.	.	1	1	1	.
Hypericum perfoliatum	1	.	.	.	.	.	.	.	1	.	.	.
Verbascum sinuatum	.	+	.	+	.	.	.	.	.	.	.	.
Hypericum perforatum	.	.	.	.	+	.	+	.	.	.	.	.
Centaurea nicaeensis	.	.	.	.	.	.	+	.	.	.	.	.
Asperula aristata subsp. *scabra*	.	.	.	.	.	.	.	.	.	.	+	.
Other species												
Daucus carota	2	3	2	2	.	+	1	+	1	1	1	1
Centranthus ruber	1	.	.	1	.	.	.	+	1	1	1	.
Origanum heracleoticum	+	.	.	+	.	.	.	.	2	2	+	.
Phlomis fruticosa	.	.	.	.	.	.	.	1	+	1	2	.
Dasypirum villosum	.	.	.	.	.	.	.	.	1	1	1	.
Vicia villosa	.	.	.	.	.	.	.	.	1	1	.	.
Allium subhirsutum	+	.	.	.	.	.	+	.	.	.	.	.
Euphorbia characias	1	.	.	+	.	.	.	.	.	.	.	.
Chondrilla juncea	1	.	.	.	.	+	.	.	.	.	.	.
Anemone hortensis	.	.	.	.	.	.	.	.	.	+	+	.
Euphorbia dendroides	.	1	.	.	.	.	.	.	.	.	.	+
Trifolium campestre	.	.	.	.	.	.	.	1	.	.	.	+
Verbascum thapsus	.	.	.	.	.	.	.	.	.	+	.	.
Ruta chalepensis	.	.	.	.	.	.	.	.	.	.	+	.
Pistacia terebinthus	.	.	.	.	.	.	.	1	.	.	.	.
Pteridium aquilinum	+	.	.	.	.	.	.	.	.	.	.	.
Asparagus acutifolius	+	.	.	.	.	.	.	.	.	.	.	.
Dorycnium hirsutum	.	.	.	.	+	.	.	.	.	.	.	.
Pyrus spinosa	.	.	.	.	.	.	.	.	.	.	.	+
Scolymus hispanicus	.	.	.	.	.	.	.	.	.	.	.	1
Briza maxima	.	.	.	.	.	.	.	.	.	.	.	+
Sarcopoterium spinosum	.	.	.	.	.	.	.	.	.	.	.	+
Trifolium stellatum	.	.	.	.	.	.	.	.	.	.	.	+
Trifolium angustifolium	.	.	.	.	.	.	.	.	.	.	.	+
Onobrychis caput-galli	.	.	.	.	.	.	.	.	.	.	.	+

Place and date of relevés
Rel.1-4: Valle dell'Anapo (Siracusa), V.1997
Rel.5-7: Sortino (Siracusa), 26.V.1995
Rel.8-11: Valle dell'Anapo (Siracusa), 30.IV.1995
Rel.12: Riserva "Grotta Monello" (Siracusa), 13.V.2004

Table 3
Ferulo communis-Hyparrhenietum hirtae

Relevé	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
Altitude (mt a.s.l.)	60	70	570	560	550	520	600	25	585	50	75	60	250	250	250	20	20	30	20	30	20	272	280	270
Plot size (sq.m.)	100	60	20	30	50	40	40	100	50	50	50	50	30	50	50	50	50	30	30	50	30	50	150	20
Cover (%)	100	100	90	90	90	100	90	100	100	100	100	100	100	100	100	100	100	100	100	100	100	80	80	60
Char. Association																								
Ferula communis	1	1	1	2	1	1	1	1	+	2	2	1	2	2	2	1	+	2	1	1	+	1	1	+
Char. Alliance (*HYPARRHENION HIRTAE*) and Order (*HYPARRHENIETALIA HIRTAE*)																								
Hyparrhenia hirta	5	4	2	3	2	1	2	5	3	4	5	5	4	4	4	4	3	4	4	3	4	4	4	3
Andropogon distachyus	2	1	4	4	4	5	3	2	2	2	2	3	1	1	1	.	+	+	.	1	.	.	.	.
Foeniculum piperitum	+	+	+	.	+	.	+	.	+	1	+	+	1	+	.	.	1	.	.	1	1	+	+	+
Lathyrus articulatus	1	2	.	.	.	.	.	2	.	+	+	+	1	1	+	.	.	+	1	.	+	.	.	.
Carlina gummifera	1	.	2	2	1	1	1	1	3	1	1	+	.	.	.	.	.	.	.	.	.	.	.	2
Micromeria graeca	.	.	.	.	.	1	1	1	.	.	.	1	1	.	+	+	+	1	.	.	+	.	.	1
Convolvulus althaeoides	+	.	.	.	.	.	.	.	.	+	+	+	+	+	.	.	.	.	+	.	.	+	.	.
Ampelodesmos mauritanicus	.	.	.	.	.	.	.	.	+	1	+	+	.	.	.	.	.	.	.	.	.	.	1	1
Phagnalon saxatile	.	+	.	.	.	+	.	.	.	.	+	+	.	.	.	.	.	.	.	.	.	.	.	.
Gypsophila arrostii	2	1	.	.	.	.	.	+	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Heteropogon contortus	.	.	.	.	.	.	.	.	.	2	1	1	.	.	.	.	.	.	.	.	.	.	.	.
Char. Class (*LYGEO-STIPETEA*)																								
Asphodelus ramosus	1	1	1	+	1	2	2	.	+	1	+	+	3	3	2	1	2	2	+	1	+	.	1	1
Carlina hispanica subsp. *globosa*	3	2	2	2	1	2	1	1	1	1	2	1	2	2	2	1	1	2	2	1	1	.	.	.
Dactylis hispanica	1	2	2	2	2	1	+	+	2	.	.	.	2	1	2	1	2	2	1	2	2	.	1	.
Reichardia picroides	+	.	1	1	+	1	1	2	.	.	.	.	+	+	+	1	+	1	2	2	1	+	+	+
Charybdis maritima	+	+	2	1	3	2	+	.	.	.	.	.	.	.	+	.	+	+	.	+	.	.	1	1
Bituminaria bituminosa	1	+	1	1	2	1	1	1	1	2	1	1	.	.	.	.	.	.	.	.	.	.	.	.
Thapsia garganica	1	.	.	.	.	.	.	.	+	.	.	.	1	.	1	1	+	1	1	1	+	.	.	.
Pallenis spinosa	+	+	1	1	1	1	1	.	+	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Calamintha nepeta	+	+	.	.	.	.	.	.	.	.	.	.	1	1	+	.	1	.	+	1	+	.	.	.
Elaeoselinum meoides	2	1	2	2	3	2	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	2
Lobularia maritima	+	.	.	.	.	.	.	1	+	+	+	+	.	.	.	.	.	.	.	.	.	+	+	.
Sanguisorba minor subsp. *minor*	+	+	.	+	.	+	1	+	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Anthyllis vulneraria subsp. *maura*	.	.	+	+	+	1	+	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Convolvulus elegantissimus	1	+	.	.	.	.	.	+	.	1	+	.	.	.	.	.	.	.	.	.	.	.	.	.
Verbascum sinuatum	+	+	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	+	+	.
Scabiosa maritima	.	.	+	+	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.
Hypericum perforatum	+	.	.	.	.	.	.	.	1	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.
Allium sphaerocephalon	.	.	.	.	.	+	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Convolvulus cantabrica	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.
Other species																								
Asparagus acutifolius	+	.	.	.	.	.	.	1	.	.	.	.	1	1	+	1	1	1	1	1	1	.	.	.
Daucus carota	2	2	.	.	.	.	.	.	1	.	.	.	1	+	.	1	2	1	+	1	1	.	.	.
Asparagus albus	.	+	.	.	.	.	.	.	.	+	+	+	1	+	+	1	.	1	.	+	.	.	1	.
Silene vulgaris subsp. *angustifolia*	.	.	.	.	.	.	.	.	.	.	.	.	1	+	1	2	1	+	+	1	+	.	.	.
Vicia villosa	.	.	.	.	.	.	.	.	.	.	.	.	2	1	1	1	1	1	+	1	1	.	.	.
Isatis canescens	.	.	.	.	.	.	.	.	.	.	.	.	+	.	+	+	1	1	1	+	+	.	.	.
Calicotome infesta	.	.	.	+	.	+	+	.	.	.	.	.	.	.	.	+	.	.	1	2	1	.	.	.
Lotus cytisoides	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	1	1	1	1	1	.	.	.
Biscutella didyma	.	.	.	.	.	.	.	.	.	.	.	.	+	+	+	.	+	1	.	.	+	.	.	.
Tolpis virgata	.	.	+	+	+	.	+	+	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Brachypodium rupestre	.	.	2	2	1	1	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Carex flacca subsp. *serrulata*	.	.	2	2	2	2	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Galium aetnicum	.	.	2	2	2	2	2	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Ophrys lutea	+	+	+	.	+	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Urospermum dalechampii	.	.	.	.	.	.	+	1	1	.	+	+	.	.	.	.	.	.	.	.	.	.	.	.
Orchis italica	.	.	+	.	+	+	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1
Anthyllis tetraphylla	.	+	.	.	.	+	.	+	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Lotus edulis	1	2	.	.	.	.	.	1	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Teucrium fruticans	.	.	.	.	.	.	.	+	.	+	+	+	.	.	.	.	.	.	.	.	.	.	.	.
Arisarum vulgare	.	.	.	.	.	.	.	.	.	.	.	.	.	1	1	.	.	.	.	.	.	.	1	1
Euphorbia ceratocarpa	.	.	.	.	.	.	.	.	.	.	.	.	1	+	1	.	.	.	.	.	.	.	.	.
Scorpiurus muricatus	+	+	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Lotus ornithopodioides	2	+	.	.	.	.	.	2	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Plantago serraria	.	.	.	.	+	.	+	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Tragopogon porrifolius	.	.	.	.	+	+	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Trifolium campestre	1	+	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Salvia verbenaca	.	.	.	.	.	.	.	.	.	.	.	.	.	+	1	.	.	.	.	.	.	.	.	.
Rumex acetosa	.	.	.	.	.	.	.	.	.	.	.	.	.	+	+	.	.	.	.	.	.	.	.	.
Achillea ligustica	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	+	.	.	.	.
Anchusella cretica	1	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Bellardia trixago	1	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Briza maxima	+	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Cynara cardunculus	.	.	.	.	.	.	.	.	.	.	+	+	.	.	.	.	.	.	.	.	.	.	.	.
Crupina crupinastrum	+	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Hymenocarpus circinnatus	+	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Leontodon tuberosus	.	.	.	.	+	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Leopoldia comosa	.	.	.	.	+	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Medicago murex	+	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Parentucellia viscosa	1	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Petrorhagia velutina	+	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Scolymus hispanicus	.	.	.	+	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Sedum album	.	.	+	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Trifolium angustifolium	+	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Trifolium arvense	+	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Trifolium cherleri	1	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.

Place and date of relevés
Rel.1-2: Prima di Fondaco Parrino (Forza d'Agrò, Messina), 18.VI.1997
Rel.3-7: Presso Borgo Piano Torre (Messina), 25.IV.1997
Rel.8: tra Furci Siculo e Grotte (Messina), 9.V.1996
Rel.9: sopra Graniti (Messina), 13.VI.1996
Rel.10-12: Taormina, lungo il sentiero che dalla stazione ferroviaria porta al paese, 2.VI.1996
Rel.13-15: Gaurdiola Cantarella (San Gregorio, Catania), 20.IV.1994
Rel.16-21: Scogliera di Acicastello (Catania), 28.VII.1995
Rel.22: C.da Mueli, Montagna Grande di Salemi (Trapani), 04.VII.2006
Rel.23: Angimbè (Trapani), 15.X.2004
Rel.24: fra lo Stretto di Buturro e Fontana Carabidicchia (Trapani), 28.VI.2005

Table 9
A) *Seselio tortuosi-Ampelodesmetum mauritanici*
B) *Helictotricho convoluti-Ampelodesmetum mauritanici typicum*
C) *Helictotricho convoluti-Ampelodesmetum mauritanici stipetosum appendiculatae*

Relevé	1	2	3	4	5	6	7	8	9	10	11	12	13	14*	15	16	17
Altitude (mt a.s.l.)	600	650	600	600	600	600	650	400	420	650	700	500	800	800	780	780	750
Plot size (sq.m.)	50	100	100	100	100	80	30	70	70	100	100	100	50	50	50	50	50
Cover (%)	70	80	80	90	90	70	90	90	90	80	70	90	80	90	90	90	90
Association	A	A	A	A	A	A	A	B	B	B	B	B	C	C	C	C	C
Char. Association																	
Klasea cichoriacea	.	+	+	1	1	+	+	.	.	.	.	.	.	.	.	.	.
Seseli tortuosum var. *tortuosum*	+	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Helictotrichon convolutum	.	.	.	.	.	.	.	2	2	2	1	3	1	2	1	2	2
Festuca caerulescens	.	.	.	.	.	.	.	.	.	.	.	.	2	2	2	3	2
Eryngium crinitum	.	.	.	.	.	.	.	.	.	.	.	.	1	2	1	1	+
Klasea mucronata	.	.	.	.	.	.	.	.	.	.	.	.	+	+	.	.	2
Oncostema cerulea	.	.	.	.	.	.	.	.	.	1	1	.	.	.	.	.	.
Char. Subassociation																	
Stipa austroitalica subsp. *appendiculata*	.	.	.	.	.	.	.	.	.	.	.	.	2	3	3	1	3
Stipa barbata	.	.	.	.	.	.	.	.	.	.	.	.	1	1	+	.	+
Char. Alliance (*AVENULO-AMPELODESMION MAURITANICI*)																	
Ampelodesmos mauritanicus	3	4	4	4	4	4	4	4	4	5	4	4	3	3	3	4	4
Avenula cincinnata	1	+	+	+	.	+	.	.	.	1	.	1	1	1	1	2	1
Eryngium bocconei	1	.	.	.	.	.	.	1	.	1	+	.	+	+	1	+	1
Scorzonera columnae	.	.	.	.	.	.	.	.	.	+	1	.	+	2	+	1	2
Helminthotheca aculeata	.	+	.	.	.	.	.	2	2	.	.	+	+	.	.	+	.
Pimpinella anisoides	.	.	.	.	.	.	.	.	.	.	.	+	.	+	+	+	+
Gypsophila arrostii	.	1	.	.	+	.	1	.	.	.	.	.	.	.	.	.	.
Dianthus graminifolius	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.
Char. Order (*HYPARRHENIETALIA HIRTAE*)																	
Carlina gummifera	2	2	1	+	+	1	2	1	.	2	3	+	.	1	.	+	+
Micromeria graeca	.	1	1	1	.	+	1	.	+	.	.	+	+	1	1	1	+
Kundmannia sicula	.	1	2	.	.	.	1	.	1	1	.	+	.	1	.	+	+
Hyoseris radiata	.	.	.	.	.	.	.	.	.	.	.	.	1	+	+	1	+
Phagnalon saxatile	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	+	+
Hyparrhenia hirta	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.
Andropogon distachyos	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.
Convolvulus altheoides	.	2	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Char. Class (*LYGEO-STIPETEA*)																	
Asphodelus ramosus	1	2	+	.	+	1	.	.	1	1	1	1	3	2	1	1	2
Dactylis hispanica	1	1	.	.	.	.	.	.	1	1	1	+	2	2	1	2	2
Galium lucidum	.	.	.	+	1	.	.	1	.	.	.	1	1	1	+	1	1
Anthyllis vulneraria subsp. *maura*	.	.	+	.	.	.	.	1	.	2	1	.	1	+	.	2	1
Elaeoselinum meoides	.	.	.	.	.	.	.	.	+	1	.	.	1	+	1	+	1
Pallenis spinosa	.	.	+	.	.	+	.	.	.	.	.	.	+	1	+	+	+
Carlina hispanica subsp. *globosa*	.	+	+	+	.	+	.	+	.	.	.	.	1	+	+	+	.
Charybdis maritima	1	+	.	.	.	.	1	+	.	1	1	+	.	.	.	.	.
Reichardia picroides	.	+	.	.	.	.	.	.	.	.	.	.	1	+	+	+	+
Brachypodium retusum	.	.	.	.	.	.	.	.	.	.	.	.	2	1	1	1	1
Bituminaria bituminosa	.	.	.	.	.	.	1	.	.	+	+	1	.	.	.	.	.
Asperula aristata subsp. *scabra*	+	.	.	.	.	.	.	.	.	+	+	.	.	.	.	.	.
Asphodeline lutea	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	+	.
Scabiosa maritima	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+
Convolvulus cantabrica	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.
Other species																	
Teucrium fruticans	.	.	2	1	2	1	2	.	.	.	+	.	.	+	.	+	1
Poa bulbosa	.	.	.	+	+	+	.	.	.	.	.	.	1	1	1	.	2
Eryngium campestre	+	1	+	.	.	+	.	+	.	+	+	.	.	.	.	.	.
Pulicaria odora	.	.	.	1	2	.	.	.	.	.	.	1	+	.	.	+	+
Daphne gnidium	.	.	+	+	+	.	1	+	.	.	.	+	.	.	.	.	.
Cistus creticus	.	.	1	2	3	1	+	.	.	.	.	2	.	.	.	.	.
Bromus erectus	.	.	.	.	.	.	.	.	.	.	.	.	2	1	1	2	3
Thymbra capitata	+	.	1	1	.	1	+	.	.	.	.	.	.	.	.	.	.
Lolium rigidum	.	.	.	.	.	.	.	.	.	.	.	.	1	1	+	+	.
Crepis bulbosa	.	.	.	.	.	.	.	.	.	.	.	.	1	+	+	.	+
Cistus eriocephalus	.	.	.	.	.	.	.	1	.	.	.	.	.	.	1	+	1
Erica multiflora	.	.	.	.	.	.	.	.	+	.	.	2	.	.	.	1	1
Teucrium flavum	.	.	.	.	+	+	.	.	.	.	+	+	.	.	.	.	.
Phagnalon rupestre	.	.	+	.	.	1	1	.	.	.	.	+	.	.	.	.	.
Helminthotheca echioides	.	.	+	1	2	1	.	.	.	.	.	.	.	.	.	.	.
Erysimum bonannianum	.	.	.	.	.	.	.	.	.	.	.	.	+	.	1	+	.
Calicotome infesta	.	.	.	.	.	.	.	.	.	.	.	.	.	+	1	.	1
Diplotaxis crassifolia	.	.	.	.	.	.	.	+	+	.	.	+	.	.	.	.	.
Fumana thymifolia	1	.	+	.	.	+	.	.	.	.	.	.	.	.	.	.	.
Muscari atlanticum	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	+
Scorzonera deliciosa	.	.	.	.	.	.	.	.	.	.	.	.	+	+	.	.	.
Ranunculus rupestris	.	.	.	.	.	.	.	.	.	.	.	.	.	+	+	.	.
Erysimum metlesicsii	.	.	.	.	.	.	.	.	.	+	+	.	.	.	.	.	.
Coronilla emerus	.	.	.	.	1	.	.	2	.	.	.	.	.	.	.	.	.
Lonicera implexa	.	.	.	.	1	.	.	.	.	.	.	1	.	.	.	.	.
Prasium majus	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.

Place and date of relevés
Rel. 1: Corvillo (Calatnissetta), 9.VI.20032
Rel. 2: Cacchiamo (Caltanissetta), 9.VI.2003
Rel. 3-6: Monte Ziambalio (Enna), 6.IV.2004
Rel. 7: S.S. Catania-Gela (presso Caltagirone), 17.V.2004
Rel. 8: Alifurci, Milena (Caltanissetta), 28.IV.2003
Rel. 9: Monte Conca (Caltanissetta), 28.IV.2003
Rel. 10-11: Serre di Ciminna (Palermo), 16.VI.2004
Rel. 12: Monte Groticelle (Agrigento), 22.VI.2005
Rel. 13-17: Monte Grifone (Palermo), 10.V.1996

Table 14 - Synoptic table of the *Thero-Brachypodion ramosi* in Sicily

Association	1	2	3	4	5	6	7
Number of relevés	10	6	2	5	3	7	6
Char. Association							
Pulicaria odora	V	.	.	.	.	.	.
Coronilla valentina subsp. *glauca*	.	V	2	.	.	.	.
Phagnalon viride	.	V	.	.	.	.	.
Helminthotheca aculeata	.	.	.	V	3	.	.
Dianthus graminifolius	.	.	.	.	.	V	.
Cachrys sicula	.	.	.	.	.	.	V
Char. Alliance (*THERO-BRACHYPODION RAMOSI*)							
Brachypodium retusum	V	V	2	V	3	V	V
Char. Order (*HYPARRHENIETALIA HIRTAE*)							
Foeniculum piperitum	IV	III	.	.	1	V	II
Hyoseris radiata	.	V	1	.	2	IV	IV
Convolvulus althaeoides	IV	I	.	IV	.	I	.
Ferula communis	.	III	2	.	.	III	II
Hyparrhenia hirta	II	.	1	III	.	.	I
Micromeria graeca	I	.	.	.	1	IV	II
Kundmannia sicula	.	.	.	.	3	V	III
Phagnalon saxatile	.	.	1	IV	.	II	.
Carlina gummifera	.	.	.	.	.	II	I
Cachrys libanotis	.	.	.	.	1	II	.
Lathyrus articulatus	.	.	.	.	2	.	I
Char. Class (*LYGEO-STIPETEA*)							
Dactylis hispanica	IV	V	2	V	3	V	IV
Reichardia picroides	II	V	.	IV	2	II	V
Asphodelus ramosus	I	.	.	II	2	III	III
Pallenis spinosa	.	III	.	III	1	III	III
Bituminaria bituminosa	.	II	.	V	1	V	V
Charybdis maritima	.	.	.	II	1	III	II
Sanguisorba minor subsp. *minor*	I	.	.	.	1	I	I
Ampelodesmos mauritanicus	.	.	1	.	2	V	II
Anthyllis vulneraria subsp. *maura*	.	.	.	.	2	V	III
Carlina hispanica subsp. *globosa*	IV	V	.	III	.	.	.
Thapsia garganica	.	.	.	.	1	II	II
Convolvulus cantabrica	.	.	.	.	1	II	III
Dittrichia viscosa	IV	II	.	.	.	.	.
Piptatherum miliaceum subsp. *miliaceum*	.	.	.	III	.	.	I
Lobularia maritima	.	.	.	.	.	I	I
Calamintha nepeta	I	I	.	.	.	.	.
Elaeoselinum meoides	.	.	.	.	1	III	.
Scabiosa atropurpurea	.	.	.	.	.	V	II
Avenula cincinnata	.	.	.	.	.	III	.
Pimpinella anisoides	.	.	.	.	.	II	.
Galium lucidum	.	.	.	II	.	.	.
Centaurea nicaeensis	.	.	.	.	.	.	I
Hypericum perfoliatum	I	.	.	.	.	.	.
Petrorhagia illyrica subsp. *haynaldiana*	.	.	.	.	.	I	.

1 - *Pulicario odorae-Brachypodietum retusi* (after Ferro & Ladero 1996, tab.1)
2 - *Coronillo glaucae-Brachypodietum retusi* (after Brullo et al. 2006, tab.3B)
3 - *Coronillo glaucae-Brachypodietum retusi* (tab.15A)
4 - *Helminthotheco aculeatae-Brachypodyetum retusi* (after Brullo et al. 2006, tab.3A)
5 - *Helminthotheco aculeatae-Brachypodyetum retusi* (tab.15B)
6 - *Diantho graminifoli-Brachypodietum retusi* (tab.15C)
7 - *Cachryo siculae-Brachypodietum retusi* (tab.15D)

Table 20 - Synoptic table of the *Moricandio-Lygeion sparti* in Sicily

Association	1	2	3	4	5	6	7	8	9	10	11	12
Number of relevés	8	10	3	4	4	6	3	15	4	6	20	2
Char. Association												
Phagnalon rupestre subsp. *annoticum*	.	.	.	4	3	V	1	.	.	.	.	.
Asparagus stipularis	.	.	.	3	1	V	2	.	.	.	.	.
Lavatera agrigentina	.	.	.	.	.		.	V	4	.	I	.
Allium agrigentinum	.	.	.	.	.		.	IV	.	.	.	.
Limonium calcarae	.	.	.	.	.		.	I	.	.	.	.
Tripolium sorrentini	.	.	.	.	.		.	.	.	V	V	2
Char. Alliance (*MORICANDIO-LYGEION SPARTI*) and Order (*LYGEO-STIPETALIA*)												
Lygeum spartum	V	V	3	V	4	V	3	V	4	I	I	2
Eryngium dichotomum	V	V	3	.	.		.	III	2	IV	I	.
Eryngium triquetrum	III	.	3	.	2		.	.	1	II	I	.
Moricandia arvensis	I	IV	.	4	.		.	III	1	.	I	.
Capparis sicula	.	III	.	3	.	II	.	III	1	.	.	.
Char. Class (*LYGEO-STIPETEA*)												
Dactylis hispanica	I	.	3	3	4	V	3	I	1	IV	I	.
Asphodelus ramosus	V	III	3	4	4	V	3	.	2	.	I	.
Charybdis maritima	III	III	3	4	4	V	3	.	1	.	.	.
Asphodeline lutea	III	.	1	.	.		.	II	1	II	I	.
Pallenis spinosa	III	.	.	1	4	III	.	II	1	.	I	.
Reichardia picroides	.	.	.	1	1		.	.	2	IV	.	.
Elaeoselinum meoides	I	.	3	.	3		.	.	.	.	.	.
Ferula communis	.	.	1	.	4		.	.	2	.	.	.
Hyparrhenia hirta	.	II	.	4	2	III	.	.	.	.	.	.
Scabiosa maritima	I	.	.	.	.		.	.	.	II	I	.
Thapsia garganica	III	.	.	.	.	V	1	.	1	.	.	.
Allium arvense	.	.	.	2	.		.	II	.	.	.	.
Ampelodesmos mauritanicus	.	.	.	1	2		.	.	.	.	.	.
Carlina hispanica subsp. *globosa*	.	IV	.	.	.	V	2	.	.	.	.	.
Convolvulus althaeoides	I	.	.	.	.	V	1	.	.	.	.	.
Dittrichia viscosa	.	IV	.	1	.		.	.	.	.	.	.
Foeniculum piperitum	.	.	.	.	.		.	.	1	.	.	.
Hyoseris radiata	I	.	.	.	.		.	.	.	.	.	.
Kundmannia sicula	.	.	.	.	1		.	.	.	.	.	.
Micromeria graeca	I	.	.	.	.		.	.	.	.	.	.
Phagnalon saxatile	.	.	.	.	3		.	.	.	.	.	.

1 - *Eryngio dichotomi-Lygeetum sparti* (after Gentile & Di Benedetto 1961, tab.4)
2 - *Eryngio dichotomi-Lygeetum sparti* (after Brullo & Siracusa 2000)
3 - *Eryngio dichotomi-Lygeetum sparti* (tab.21D)
4 - *Phagnalo annotici-Lygeetum sparti* (after Brullo et al. 2000)
5 - *Phagnalo annotici-Lygeetum sparti* (after Bazan et al. 2006, tab.6)
6 - *Phagnalo annotici-Lygeetum sparti* (after Giusso et al. 2008, tab.14)
7 - *Phagnalo annotici-Lygeetum sparti* (tab.21A)
8 - *Lavatero agrigentinae-Lygeetum sparti* (after Brullo 1985, tab.1)
9 - *Lavatero agrigentinae-Lygeetum sparti* (tab.21B)
10 - *Asteretum sorrentini* (after Brullo 1985, tab.2)
11 - *Asteretum sorrentini* (after Venturella et al. 1986, tab.1)
12 - *Asteretum sorrentini* (tab.21C)

Table 6
Hyparrhenio hirtae-Festucetum humifusae

Relevé	1	2*	3	4	5	6	7	8	9	10
Altitude (mt a.s.l.)	15	20	20	200	190	210	200	220	215	215
Plot size (sq.m.)	10	10	5	10	5	5	10	10	5	5
Cover (%)	80	100	80	90	80	80	90	100	100	90
Slope (°)	50	40	60	20	30	20	10	-	20	30
Exposure	NW	NNW	W	E	NNW	W	NE	-	E	NE
Char. Association										
Festuca humifusa	3	4	3	2	3	3	3	3	2	2
Char. Alliance (*HYPARRHENION HIRTAE*) and Order (*HYPARRHENIETALIA HIRTAE*)										
Hyparrhenia hirta	2	1	1	3	3	3	2	3	2	3
Hyoseris radiata	1	1	2	+	2	2	1	1	+	+
Micromeria graeca	2	2	1	1	+	1	1	+	1	2
Phagnalon saxatile	3	1	+	1	1	2	1	+	1	1
Lobularia maritima	.	+	+	+	1	+	+	1	+	+
Ampelodesmos mauritanicus	1	2	.	1	1	2	2	.	1	2
Andropogon distachyos	.	.	.	2	1	2	2	2	1	2
Ferula communis	.	.	.	1	1	1	.	.	.	.
Convolvulus althaeoides	.	.	+	.	.	.	.	.	.	.
Char. Class (*LYGEO-STIPETEA*)										
Dactylis hispanica	2	1	2	2	1	2	2	2	1	2
Bituminaria bituminosa	1	1	1	1	1	2	2	2	+	1
Galium lucidum	2	1	2	2	1	1	.	2	1	1
Carlina hispanica subsp. *globosa*	+	+	.	1	1	+	+	+	.	+
Anthyllis vulneraria subsp. *maura*	.	.	.	1	1	1	1	1	2	2
Charybdis maritima	.	.	.	.	1	.	2	1	+	+
Sedum sediforme	.	.	.	.	2	1	.	.	1	1
Pallenis spinosa	.	.	.	.	.	+	1	+	.	1
Allium sphaerocephalon	.	.	.	.	.	.	.	+	+	+
Reichardia picroides	1	+	1	.	.	.	.	.	.	.
Thapsia garganica	+	+	1	.	.	.	.	.	.	.
Allium arvense	+	.	.	.	.	.	.	.	.	.
Other species										
Euphorbia dendroides	1	2	.	1	1	1	1	1	1	+
Centaurea seguenzae	.	.	.	1	2	2	1	1	3	2
Teucrium flavum	.	2	.	.	+	+	1	+	1	+
Teucrium fruticans	1	.	.	+	1	1	+	1	.	1
Brassica fruticulosa	.	.	.	+	1	.	.	+	+	+
Lotus cytisoides	.	.	1	1	+	.	.	.	1	1
Prasium majus	1	1	.	.	.	+	.	.	.	.
Allium subhirsutum	.	.	.	.	.	.	.	.	+	1
Calicotome infesta	+	+	.	.	.	.	.	.	.	.
Daucus gingidium	+	.	2	.	.	.	.	.	.	.
Poa bulbosa	.	.	.	.	.	.	.	+	+	.
Carthamus lanatus	.	.	.	+	.	.	.	.	.	.
Dianthus rupicola	.	.	+	.	.	.	.	.	.	.

Place and date of relevés
Rel.1-3: Rupe di Tindari, versante occidentale, (Messina), 25.IV.1997
Rel.4-10: Rupe di Tindari, sommità, (Messina), 25.IV.1997

Table 11
Avenulo cincinnatae-Brachypodietum phoenicoidis

Relevé	1	2	3*	4	5
Altitude (mt a.s.l.)	900	900	920	960	960
Plot size (sq.m.)	10	10	20	10	20
Cover (%)	100	100	100	100	100
Slope (°)	40	40	50	50	40
Exposure	N	NW	NW	N	NW
Char. Association					
Brachypodium phoenicoides	3	3	4	4	4
Char. Alliance (*AVENULO-AMPELODESMION MAURITANICI*)					
Avenula cincinnata	3	3	3	2	2
Dianthus graminifolius	.	1	+	+	+
Pimpinella anisoides	+	1	1	.	.
Gypsophila arrostii	1	.	+	+	.
Char. Order (*HYPARRHENIETALIA HIRTAE*)					
Micromeria graeca	2	3	2	2	2
Hyoseris radiata	1	1	1	1	1
Char. Class (*LYGEO-STIPETEA*)					
Dactylis hispanica	1	2	2	2	2
Anthyllis vulneraria subsp. *maura*	2	1	2	2	2
Calamintha nepeta	1	1	1	2	1
Pallenis spinosa	1	1	1	1	2
Charybdis maritima	1	1	2	+	1
Asphodelus ramosus	1	1	1	1	+
Asphodeline lutea	1	+	+	1	+
Allium arvense	+	+	+	+	+
Reichardia picroides	1	+	1	.	+
Carlina sicula	.	+	+	+	1
Asperula aristata subsp. *scabra*	+	1	2	.	+
Scabiosa maritima	+	.	.	1	+
Petrorhagia illyrica subsp. *haynaldiana*	.	+	+	.	.
Other species					
Festuca circummediterranea	2	1	2	2	2
Thymus spinulosus	2	2	1	2	+
Bonannia graeca	+	+	1	1	2
Euphorbia rigida	1	1	+	+	1
Teucrium chamaedrys	.	1	1	1	.
Sedum tenuiflorum	.	.	+	.	+
Daucus carota	.	.	.	.	+
Arabis rosea	.	.	.	.	+

Place and date of relevés
Rel.1-5: Gangi (Palermo), 5.VII.1994

Table 7
A) ***Stipo gussonei-Hyparrhenietum hirtae***
B) ***Bothriochloo panormitanae-Hyparrhenietum hirtae***
C) ***Phalarido coerulescentis-Hyparrhenietum hirtae***

Relevé	1	2	3	4	5	6	7*	8	9	10*
Altitude (mt a.s.l.)	150	160	140	220	220	240	250	20	45	60
Plot size (sq.m.)	50	50	50	50	50	50	50	10	25	25
Cover (%)	60	60	70	100	100	100	100	80	100	100
Slope (°)	2	-	-	-	-	-	-	15	10	2
Exposure	NW	-	-	-	-	-	-	SW	E	E
Association	A	A	A	A	A	A	A	B	C	C
Char. Association										
Stipa gussonei	1	2	3	1	2	3	3	.	.	.
Echinophora tenuifolia	.	.	.	1	.	+	+	.	.	.
Bothriochloa panormitana	.	.	.	.	.	.	.	2	.	.
Phalaris coerulescens	.	.	.	.	.	.	.	.	+	2
Char. Suballiance (*PANICO-HYPARRHENENION HIRTAE*)										
Panicum repens	.	.	.	.	.	.	.	.	4	3
Char. Alliance (*HYPARRHENION HIRTAE*) and Order (*HYPARRHENIETALIA HIRTAE*)										
Hyparrhenia hirta	2	2	3	5	4	5	5	1	2	2
Lathyrus articulatus	.	.	.	1	+	+	.	.	.	.
Thapsia garganica	+	.	.	.	.	.	.	1	.	.
Scorzonera columnae	.	+	.	.	.	.	.	.	.	.
Foeniculum piperitum	.	.	.	.	.	.	.	.	1	.
Char. Class (*LYGEO-STIPETEA*)										
Asphodelus ramosus	1	1	1	1	1	+	+	1	.	.
Dactylis hispanica	.	+	.	+	2	1	1	+	.	.
Charybdis maritima	1	.	.	+	1	+	1	.	.	.
Cachrys pungens	.	.	.	2	1	2	+	.	.	.
Anthyllis vulneraria subsp. *maura*	.	.	.	1	1	+	2	.	.	.
Convolvulus elegantissimus	.	.	.	2	1	1	+	.	.	.
Scabiosa atropurpurea	1	1	1	.	.	.	.	.	.	.
Pallenis spinosa	1	+	1	.	.	.	.	.	.	.
Pimpinella anisoides	+	+	1	.	.	.	.	.	.	.
Carlina gummifera	+	+	.	.	.	.	.	.	.	.
Carlina sicula	+	.	.	.	.	.	.	.	.	.
Convolvulus cantabrica	+	.	.	.	.	.	.	.	.	.
Sanguisorba minor subsp. *minor*	.	+	.	.	.	.	.	.	.	.
Allium sphaerocephalon	.	.	+	.	.	.	.	.	.	.
Calendula suffruticosa subsp. *fulgida*	.	.	.	.	.	.	.	1	.	.
Reichardia picroides	.	.	.	.	.	.	.	.	1	.
Bituminaria bituminosa	.	.	.	.	.	.	.	.	+	.
Other species										
Alkanna tinctoria	1	1	1	2	2	1	2	.	.	.
Teucrium capitatum	+	+	2	2	2	2	1	.	.	.
Daucus carota	.	.	.	+	+	+	1	.	+	1
Euphorbia terracina	.	1	+	+	+	+	+	.	.	.
Lotus cytisoides	+	.	.	1	1	2	1	.	.	.
Ajuga pseudoiva	.	1	+	1	+	.	.	.	.	.
Fumana thymifolia	.	.	.	1	+	1	1	.	.	.
Launea resedifolia	.	.	.	+	+	+	1	.	.	.
Scorzonera deliciosa	.	.	.	+	1	+	+	.	.	.
Arysarum vulgare	.	.	.	1	.	+	1	.	.	.
Asparagus albus	.	+	+	.	.	.	.	1	.	.
Cachrys sicula	+	1	1	.	.	.	.	.	.	.
Convolvulus lineatus	1	+	1	.	.	.	.	.	.	.
Erodium laciniatum	.	.	.	+	+	.	+	.	.	.
Gladiolus communis subsp. *byzantinus*	1	+	.	.	.	.	.	.	.	+
Leopoldia comosa	.	.	.	+	+	.	+	.	.	.
Podospermum laciniatum	.	.	.	+	+	.	+	.	.	.
Stipa capensis	3	2	2	.	.	.	.	.	.	.
Avena barbata	.	.	.	.	.	.	.	.	1	+
Cistus salviifolius	.	.	.	+	+	.	.	.	.	.
Convolvulus arvensis	.	.	.	.	.	.	.	.	+	+
Helichrysum stoechas	.	.	.	+	.	+	.	.	.	.
Linaria multicaulis	+	+	.	.	.	.	.	.	.	.
Ornithogalum gussonei	+	+	.	.	.	.	.	.	.	.
Salvia verbenaca	.	+	+	.	.	.	.	.	.	.
Thymbra capitata	1	1	.	.	.	.	.	.	.	.

Place and date of relevés
Rel.1-3: Magaggiari di Campobello (Trapani), 10.V.2005
Rel.4-7: Bosco di Santo Pietro (Caltagirone), 14.IV.2007
Rel.8: Isolidda, S. Vito Lo Capo, 11.IV.2006
Rel.9-10: Scopello (ai margini della strada), 10.VII.2006

Table 10
Astragalo huetii-Ampelodesmetum mauritanici

Relevé	1	2	3	4	5	6	7	8	9	10	11	12	13
Altitude (mt a.s.l.)	218	244	246	310	422	600	650	300	300	300	350	450	550
Plot size (sq.m.)	100	100	200	200	50	50	20	50	50	50	100	100	100
Cover (%)	60	60	90	60	60	80	70	80	80	80	90	70	80
Slope (°)	30	20	5	30	5	30	15	5	20	20	20	10	45
Exposure	SW	W	-	S	NNE	SW	NW	N	W	W	N	W	NW
Char. Association													
Astragalus huetii	2	+	+	+	1	1	2	+	1	1	1	+	+
Char. Alliance (*AVENULO-AMPELODESMION MAURITANICI*)													
Ampelodesmos mauritanicus	3	3	4	3	3	4	3	4	4	5	4	4	4
Eryngium bocconei	.	.	1	+	+	+	+	+	.	1	1	.	.
Avenula cincinnata	.	.	.	.	.	1	.	1	1	1	.	1	2
Helminthotheca aculeata	.	.	+	+	.	.	.	1	.	1	.	.	.
Scorzonera columnae	1	.	.	+	.	.	.	.	.	.	.	1	.
Dianthus graminifolius	.	.	.	.	1	.	.	.	.	.	.	1	+
Gypsophila arrostii	1	.	.	.	.	.	.	.	.	1	.	.	.
Char. Order (*HYPARRHENIETALIA HIRTAE*)													
Carlina gummifera	2	.	1	1	1	1	1	2	.	.	.	1	2
Micromeria graeca	.	.	1	.	1	.	1	1	+	1	1	.	1
Kundmannia sicula	.	.	1	+	.	+	+	2	.	+	2	.	1
Hyparrhenia hirta	2	.	.	+	.	.	.	.	1	1	1	.	.
Foeniculum piperitum	.	+	.	.	.	.	.	.	.	.	2	.	+
Andropogon distachyos	.	.	.	+	.	.	+	.	.	.	.	.	.
Phagnalon saxatile	.	.	.	.	.	.	.	.	.	.	.	.	+
Char. Class (*LYGEO-STIPETEA*)													
Asphodelus ramosus	1	1	1	1	+	1	.	1	1	1	2	1	1
Dactylis hispanica	1	.	1	1	+	.	.	+	1	1	2	1	1
Anthyllis vulneraria subsp. *maura*	.	+	+	.	1	1	1	.	.	.	1	+	2
Bituminaria bituminosa	1	.	1	.	1	.	.	.	.	.	1	+	.
Pallenis spinosa	.	.	.	.	+	.	.	+	.	.	2	+	1
Charybdis maritima	+	1	.	.	.	.	1	.	.	.	1	.	.
Elaeoselinum meoides	+	.	1	.	1	.	.	.	.	.	.	.	1
Reichardia picroides	.	+	.	.	+	.	.	.	.	.	2	.	+
Carlina hispanica subsp. *globosa*	.	.	.	.	.	.	.	1	+	.	1	.	.
Asperula aristata subsp. *scabra*	+	+	.	.	.	.	.	.	.	.	.	1	.
Galium lucidum	.	.	.	.	.	.	.	.	.	.	.	+	1
Carlina sicula	1	1	.	.	.	.	.	.	.	.	.	.	.
Scabiosa maritima	.	.	.	.	.	.	.	.	.	.	+	.	.
Calamintha nepeta	.	.	.	.	.	.	.	.	.	.	1	.	.
Thapsia garganica	.	+	.	.	.	.	.	.	.	.	.	.	.
Brachypodium retusum	.	.	+	.	.	.	.	.	.	.	.	.	.
Other species													
Chamaerops humilis	1	1	1	1	.	.	1	1	1	2	+	.	.
Teucrium fruticans	.	.	.	.	.	1	1	+	1	1	1	1	.
Thymbra capitata	.	1	.	1	.	2	1	.	1	.	1	2	.
Teucrium capitatum	.	.	.	1	1	.	.	1	.	+	+	2	.
Cistus creticus	.	.	.	.	.	2	1	+	+	.	+	.	.
Phagnalon rupestre subsp. *rupestre*	1	.	.	.	.	+	+	.	.	.	+	1	.
Fumana thymifolia	.	.	.	1	.	+	1	.	.	.	+	.	.
Asparagus acutifolius	+	.	+	.	.	.	.	.	.	+	.	.	.
Daphne gnidium	.	.	.	.	.	.	.	1	.	.	+	1	.
Eryngium campestre	.	.	+	.	.	.	.	+	.	.	.	.	2
Micromeria fruticulosa	2	1	.	1	.	.	.	.	.	.	.	.	.
Physanthyllis tetraphylla	1	+	.	+	.	.	.	.	.	.	.	.	.
Asparagus albus	.	1	.	.	.	.	.	+	.	.	.	.	.
Ononis pendula	+	.	+	.	.	.	.	.	.	.	.	.	.
Orchis italica	.	1	1	.	.	.	.	.	.	.	.	.	.
Sulla coronaria	.	.	1	.	1	.	.	.	.	.	.	.	.
Sulla glomerata	1	+	.	.	.	.	.	.	.	.	.	.	.
Ajuga iva	.	.	.	+	.	.	.	.	.	.	.	.	.
Briza maxima	.	.	+	.	.	.	.	.	.	.	.	.	.
Centaurea parlatoris	.	.	.	.	1	.	.	.	.	.	.	.	.
Helianthemum salicifolium	1	.	.	.	.	.	.	.	.	.	.	.	.
Hippocrepis ciliata	.	.	+	.	.	.	.	.	.	.	.	.	.
Linum strictum	.	.	+	.	.	.	.	.	.	.	.	.	.
Lotus cytisoides	.	.	+	.	.	.	.	.	.	.	.	.	.
Polygala monspeliaca	.	.	+	.	.	.	.	.	.	.	.	.	.
Scolymus grandiflorus	.	.	.	.	+	.	.	.	.	.	.	.	.
Senecio delphinifolius	.	.	.	+	.	.	.	.	.	.	.	.	.
Stachys ocymastrum	.	.	.	+	.	.	.	.	.	.	.	.	.
Stipa capensis	+	.	.	.	.	.	.	.	.	.	.	.	.
Teucrium flavum	.	.	.	.	1	.	.	.	.	.	.	.	.
Thymus spinulosus	.	.	.	.	+	.	.	.	.	.	.	.	.
Centaurium erythraea	.	.	.	.	.	.	.	.	.	.	.	.	1
Anacamptis pyramidalis	.	.	.	.	.	.	.	.	.	.	.	.	+
Linum bienne	.	.	.	.	.	.	.	.	.	.	.	.	+
Plantago serraria	.	.	.	.	.	.	.	.	.	.	.	.	1
Crepis vesicaria	.	.	.	.	.	.	.	.	.	.	.	.	+
Silene sicula	.	.	.	.	.	.	.	.	.	.	.	.	1
Matthiola fruticulosa	.	.	.	.	.	.	.	.	.	.	.	.	+
Crupina crupinastrum	.	.	.	.	.	.	.	.	.	.	.	.	+
Podospermum canum	.	.	.	.	.	.	.	.	.	.	.	.	+
Crepis hispida	.	.	.	.	.	.	.	.	.	.	.	.	+
Arundo collina	.	.	.	.	.	.	.	.	.	.	.	.	+

Place and date of relevés
Rel. 1: Magazzino Buturro, S.Ninfa, 8.V.2005
Rel. 2: Timpone Picara, S.Ninfa, 15.IV.2004
Rel. 3: Magazzino Buturro, S.Ninfa, 8.V.2005
Rel. 4: C.da Mondura, S.Ninfa. 8.V.2005
Rel. 5: Monte Bummulune, Buseto, 10.VI.2005
Rel. 6: Monte Zimbalio (Enna), 6.IV.2004
Rel. 7: SS Catania-Gela, presso Caltagirone), 6.I.2005
Rel. 8-10: Monte Guardia (Gela), 14.V.2003
Rel. 11: Case Monaco, presso Caltagirone, 6.I.2005
Rel. 12: presso Centuripe, 28.IV.2005
Rel. 13: sotto Centuripe, 25.V.2009

Table 8 - Synoptic table of the *Avenulo-Ampelodesmion mauritanici* in Sicily

Association	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Number of relevés	30	40	5	6	5	26	7	21	9	13	11	6	5	7	5	11
Char. Association																
Helichrysum hyblaeum	V	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Helictotrichon convolutum	.	V	V	.	V	.	.	.	I	.	.	V	.	.	.	.
Eryngium crinitum	.	II	.	.	V	.	.	.	.	.	.	.	.	.	.	.
Festuca caerulescens	.	II	.	.	V	.	.	.	II	.	.	.	.	.	.	.
Klasea flavescens subsp. *mucronata*	.	I	.	III	III	.	.	.	.	.	.	.	.	.	.	.
Oncostema cerulea	.	I	II	.	.	.	.	.	.	.	.	.	.	.	.	.
Delphinium emarginatum	.	II	.	IV	.	.	.	.	.	.	.	.	.	.	.	.
Trisetum splendens	.	II	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Stipa appendiculata	.	.	.	.	V	.	.	.	.	.	.	.	.	.	.	.
Seseli tortuosum var. *tortuosum*	.	.	.	.	.	IV	II	.	.	.	.	.	.	.	.	.
Klasea cichoracea	.	.	.	.	.	II	V	.	.	.	.	.	.	.	.	.
Galium aetnicum	.	.	.	.	.	.	.	V	.	.	.	.	.	.	.	.
Astragalus huetii	.	.	.	.	.	.	.	.	IV	V	.	.	.	.	.	.
Cardopatum corymbosum	.	.	.	.	.	.	.	.	II	.	.	.	.	.	.	.
Astragalus monspessulanus	.	.	.	.	.	.	.	.	.	.	V	.	.	.	.	.
Arrhenatherum nebrodense	.	.	.	.	.	.	.	.	.	.	.	V	.	.	.	.
Brachypodium rupestre	.	.	.	.	.	.	.	.	.	.	.	V	.	.	.	.
Festuca rubra	.	.	.	.	.	.	.	.	.	.	.	V	.	.	.	.
Brachypodium phoenicoides	.	.	.	.	.	.	.	.	.	.	.	.	V	.	.	.
Stipa sicula	.	.	.	.	.	.	.	.	.	.	.	.	.	V	V	.
Matthiola fruticulosa subsp. *fruticulosa*	.	.	.	.	.	.	.	.	.	.	.	.	.	V	.	.
Koeleria splendens subsp. *splendens*	.	.	.	.	.	.	.	.	.	.	.	.	.	IV	.	.
Stipa barbata	.	.	.	.	IV	.	.	.	.	.	.	.	.	.	.	V
Char. Alliance (*AVENULO-AMPELODESMION MAURITANICI*)																
Avenula cincinnata	IV	V	II	III	V	IV	IV	.	IV	III	II	V	V	V	V	V
Ampelodesmos mauritanicus	V	V	V	V	V	V	V	V	V	V	V	.	.	V	V	III
Pimpinella anisoides	I	II	I	.	IV	II	.	I	I	.	.	.	III	V	I	III
Scorzonera columnae	I	IV	II	IV	V	I	.	.	I	I	.	.	.	V	V	V
Gypsophila arrostii	I	I	.	.	.	IV	III	II	II	I	.	.	III	III	III	I
Dianthus graminifolius	II	III	I	.	.	III	.	.	I	I	III	.	IV	V	.	II
Eryngium bocconei	.	III	III	III	V	I	I	I	IV	III	III	.	.	.	.	.
Helminthotheca aculeata	.	II	III	.	II	I	I	II	II	II	.	.	.	.	.	.
Char. Order (*HYPARRHENIETALIA HIRTAE*)																
Micromeria graeca	V	IV	II	IV	V	IV	IV	V	V	III	V	V	V	V	.	III
Carlina gummifera	IV	III	IV	V	III	III	V	IV	IV	IV	II	III	.	.	.	III
Kundmannia sicula	II	II	III	IV	III	III	III	I	IV	III	II	.	.	.	.	IV
Hyoseris radiata	II	II	.	IV	V	I	.	I	.	.	II	V	V	II	.	.
Hyparrhenia hirta	II	II	.	III	.	II	I	V	II	II	III	.	.	.	V	.
Foeniculum piperitum	I	II	.	.	.	I	.	II	II	I	II	.	.	I	IV	II
Andropogon distachyos	II	I	.	I	.	II	I	III	.	I	I	.	.	.	V	.
Phagnalon saxatile	I	I	.	V	II	I	I	.	.	I	II	.	.	.	V	.
Convolvulus althaeoides	I	I	.	II	.	I	I	I	.	.	.	.	.	.	.	.
Lathyrus articulatus	II	I	.	I	.	.	.	III	.	.	.	V	.	.	.	.
Ferula communis	.	I	.	V	.	.	.	I	II	.	.	.	.	.	.	.
Lathyrus sylvestris	I	I	.	.	.	I	.	.	.	.	.	.	.	.	.	.
Cachrys libanotis	II	.	.	.	.	.	.	.	.	.	.	.	.	.	V	.
Cachrys sicula	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	I
Char. Class (*LYGEO-STIPETEA*)																
Anthyllis vulneraria subsp. *maura*	V	V	III	III	IV	III	I	I	II	III	II	V	V	V	III	V
Dactylis hispanica	V	V	IV	V	V	V	II	IV	IV	IV	IV	V	V	V	III	IV
Asphodelus ramosus	I	IV	IV	V	V	IV	IV	III	IV	V	III	.	V	V	V	IV
Pallenis spinosa	IV	III	.	V	.	II	II	I	I	II	III	V	V	V	IV	III
Charybdis maritima	II	II	IV	.	.	III	III	III	I	II	I	.	V	III	III	I
Reichardia picroides	II	II	.	V	V	II	I	II	I	I	I	.	IV	V	.	.
Asperula aristata subsp. *scabra*	III	V	II	.	.	III	I	.	II	I	.	V	IV	V	IV	III
Bituminaria bituminosa	IV	III	III	V	.	IV	I	IV	III	II	II	.	.	.	III	I
Carlina hispanica subsp. *globosa*	III	I	.	.	IV	III	III	V	I	I	III	V	.	.	.	II
Galium lucidum	V	III	II	.	V	II	II	.	III	I	III	V	.	.	.	I
Elaeoselinum meoides	I	IV	II	.	V	II	.	III	II	II	I	.	.	.	.	V
Scabiosa maritima	IV	II	.	I	I	II	.	.	I	I	II	V	III	.	.	.
Convolvulus cantabrica	II	III	I	III	.	I	.	.	.	.	III	.	.	III	I	IV
Asphodeline lutea	.	.	.	II	II	.	.	.	.	.	II	V	V	V	II	I
Sanguisorba minor subsp. *minor*	II	I	.	.	.	I	.	I	.	.	I	IV	.	.	.	.
Allium arvense	.	.	.	.	.	II	.	.	.	.	.	.	V	IV	.	III
Brachypodium retusum	.	II	.	V	V	.	.	.	.	I	.	.	.	.	.	.
Calamintha nepeta	.	.	.	IV	.	.	.	I	.	I	.	.	V	.	.	.
Hypericum perfoliatum	III	II	.	IV	.	.	.	.	II	.	.	.	.	.	.	.
Sedum sediforme	.	II	.	.	.	I	.	.	.	.	.	.	.	.	V	III
Thapsia garganica	.	.	.	II	.	.	.	.	.	I	.	I	.	.	.	.
Allium sphaerocephalon	.	.	.	.	.	.	.	.	.	.	II	.	.	.	.	I
Centaurea nicaeensis	.	.	.	.	.	.	.	.	.	.	.	III	.	.	.	I
Petrorhagia illyrica subsp. *haynaldiana*	.	.	.	.	.	.	.	.	.	.	.	.	II	.	.	II
Carlina sicula	.	.	.	.	.	.	.	.	.	I	.	.	.	III	.	.
Convolvulus elegantissimus	.	.	.	.	.	.	.	.	.	.	.	.	.	.	III	.
Hypericum perforatum	.	.	.	.	.	.	.	.	.	.	.	IV	.	.	.	.
Scabiosa atropurpurea	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	II
Verbascum sinuatum	.	.	.	III	.	.	.	.	.	.	.	.	.	.	.	.

1 - Helichryso hyblaei-Ampelodesmetum mauritanici (after Minissale 1995, tab.1)
2 - Helictotricho convoluti-Ampelodesmetum mauritanici (after Minissale 1995, tab.2)
3 - *Helictotricho convoluti-Ampelodesmetum mauritanici* (tab.9B)
4 - *Helictotricho convoluti-Ampelodesmetum mauritanici* (after Gianguzzi et al. 1996, tab.8)
5 - *Helictotricho convoluti-Ampelodesmetum mauritanici stipetosum appendiculatae* (tab.9C)
6 - Seselio tortuosi-Ampelodesmetum mauritanici (after Minissale 1995, tab.3)
7 - *Seselio tortuosi-Ampelodesmetum mauritanici* (tab.9A)
8 - Galio aetnici-Ampelodesmetum mauritanici (after Minissale 1995, tab.4)
9 - Astragalo huetii-Ampelodesmetum mauritanici (after Minissale 1995, tab.5)
10 - *Astragalo huetii-Ampelodesmetum mauritanici* (tab.10)
11 - Astragalo monspessulani-Ampelodesmetum mauritanici (after Minissale 1995, tab.6)
12 - *Arrhenathero nebrodensis-Helictotrichetum convoluti* (after Brullo et al. 1998, tab.5)
13 - *Avenulo cincinnatae-Brachypodietum phoenicoidis* (tab.11)
14 - *Avenulo cincinnatae-Stipetum siculae matthioletosum fruticulosae* (tab.12A)
15 - *Avenulo cincinnatae-Stipetum siculae hyparrhenietosum hirtae* (tab.12B)
16 - *Avenulo cincinnatae-Stipetum barbatae* (tab.13)

Table 17
A) ***Centrantho rubri-Euphorbietum ceratocarpae***
B) ***Diplotaxio tenuifoliae-Oryzopsietum miliaceae***
C) ***Sinapio pubescentis-Oryzopsietum miliaceae***

Relevé	1	2	3	4	5	6	7	8	9	10	11	12
Altitude (mt a.s.l.)	400	320	270	80	90	50	132	640	640	560	750	690
Plot size (sq.m.)	30	10	15	100	100	10	25	10	5	10	10	10
Cover (%)	100	100	100	80	100	100	70	100	90	100	100	100
Slope (°)	45	-	-	45	40	-	-	-	-	-	-	-
Exposure	ESE	-	-	SW	SW	-	-	-	-	-	-	-
Association	A	A	A	A	A	B	B	C	C	C	C	C
Char. Association												
Euphorbia ceratocarpa	3	4	2	3	3	.	.	.	.	.	.	.
Centranthus ruber	2	1	2	1	2	.	.	.	.	.	.	.
Diplotaxis tenuifolia	.	.	.	.	.	1	2	.	.	.	.	.
Sinapis pubescens	.	.	.	.	.	.	.	2	3	1	2	2
Char. Alliance (*BROMO-ORYZOPSION MILIACEAE*)												
Piptatherum miliaceum subsp. *miliaceum*	2	3	4	3	3	2	3	2	1	3	2	3
Dittrichia viscosa	2	1	1	1	1	.	+	1	2	2	1	2
Lepidium graminifolium	.	+	+	.	.	.	.	.	.	.	.	.
Plumbago europaea	.	.	.	.	.	1	.	.	.	.	.	.
Char. Order (*HYPARRHENIETALIA HIRTAE*)												
Hyparrhenia hirta	2	1	+	2	1	+	1	2	1	2	2	2
Foeniculum piperitum	+	2	1	+	1	.	.	1	1	1	1	1
Ferula communis	.	.	.	2	3	.	.	1	1	2	1	1
Phagnalon saxatile	+	.	.	.	.	.	.	.	.	.	+	+
Convolvulus althaeoides	1	.	.	.	.	+	.	.	.	.	.	.
Gypsophila arrostii	+	.	+	+	+	.	.	+	.	.	.	.
Andropogon distachyus	1	.	.	2	1	.	.	.	.	.	.	.
Micromeria graeca	1	.	.	.	+	.	.	.	.	.	.	.
Lathyrus articulatus	1	.	.	.	.	.	.	+	.	.	.	.
Char. Class (*LYGEO-STIPETEA*)												
Reichardia picroides	+	2	1	1	+	+	+	1	+	1	1	1
Lobularia maritima	1	.	.	.	.	+	+	+	1	+	+	.
Calamintha nepeta	1	+	+	.	.	+	+	1	2	1	2	2
Dactylis hispanica	+	1	1	+	+	.	.	.	.	.	.	.
Bituminaria bituminosa	+	2	1	+	1	.	2	+	.	+	.	.
Asphodelus ramosus	+	.	.	.	1	.	.	1	.	1	.	.
Pallenis spinosa	+	.	.	.	.	.	.	.	+	.	+	+
Carlina hispanica subsp. *globosa*	.	2	.	1	+	.	.	+	+	+	.	.
Scabiosa maritima	+	.	.	2	1	.	.	+	1	.	+	.
Verbascum sinuatum	+	.	.	.	.	+	1	.	.	.	.	.
Hypericum perforatum	.	+	.	.	.	.	.	.	.	.	.	.
Hypericum perfoliatum	.	.	.	.	.	.	.	.	1	.	.	.
Asphodeline lutea	.	.	.	.	.	.	.	.	.	.	.	+
Other species												
Daucus carota	+	1	1	1	+	1	+	+	+	+	+	+
Arundo collina	1	2	1	+	2	.	.	1	+	.	.	.
Achillea ligustica	.	.	.	.	.	.	.	+	1	1	+	+
Haynaldia villosa	.	+	+	.	.	.	.	+	.	+	.	.
Linaria purpurea	.	.	.	1	+	.	.	.	.	.	.	1
Cynodon dactylon	.	+	1	.	.	.	.	.	.	.	.	.
Reseda alba	+	.	.	+	.	.	.	.	.	.	.	.
Scolymus grandiflorus	.	.	.	.	.	1	+	.	.	.	.	.
Verbena officinalis	.	.	.	.	.	2	+	.	.	.	.	.
Teucrium flavum	1	.	.	2	.	.	.	.	.	.	.	.
Chondrilla juncea	.	+	1	.	.	.	.	.	.	.	.	.
Rumex crispus	.	+	+	.	.	.	.	.	.	.	.	.
Scrophularia bicolor	.	.	.	1	1	.	.	.	.	.	.	.
Salvia verbenaca subsp. *verbenaca*	.	+	+	.	.	.	.	.	.	.	.	.
Acanthus mollis	.	.	.	+	1	.	.	.	.	.	.	.
Opoponax chironium	.	.	.	.	.	.	.	1	1	.	.	.

Place and date of relevés
Rel.1: Salendo a M.te Scuderi, dopo il bivio di Croce (Contrada Nova), 21.VII.1996
Rel.2-3: Massicciata stradale presso Francavilla di Sicilia (Messina), 21.VII.1996
Rel.4-5: Presso Rocchenere (Pagliara, Messina), 8.VI.1996
Rel.6: Cave di Cusa (Campobello di Mazzara, Trapani), 7.VI.2005
Rel.7: Borgata Costiera, presso Mazzara del Vallo (Trapani), 25.VII.2006
Rel.8-9: lungo la strada per Pizzo Melia (Peloritani), 7.VI.1996
Rel.10: Serro Fornaci, sopra Mongiuffi (Peloritani), 7.VI.1996
Rel.11-12: presso Novara di Sicilia, 20.VII.1996

Table 2
A) ***Hyparrhenietum hirto-pubescentis***
B) ***Thapsietum pelagicae***

Relevé	1	2	3	4	5*	6	7
Altitude (mt a.s.l.)	130	130	156	200	10	20	50
Plot size (sq.m.)	100	100	25	25	50	20	20
Cover (%)	80	80	40	60	80	90	90
Slope (°)	10	15	30	20	-	-	-
Exposure	SW	S	SW	S	-	-	-
Association	A	A	A	A	B	B	B
Char. Association							
Andropogon distachyos	+	+	2	1	.	.	.
Thapsia pelagica	.	.	.	.	3	2	3
Char. Alliance (*HYPARRHENION HIRTAE*) and Order (*HYPARRHENIETALIA HIRTAE*)							
Hyparrhenia hirta	2	4	1	3	1	2	2
Phagnalon saxatile subsp. *saxatile*	.	.	+	+	2	2	1
Lobularia maritima	1	+	.	.	+	1	1
Foeniculum piperitum	+	.	.	.	+	2	1
Micromeria graeca subsp. *graeca*	+	1	.	1	.	.	.
Convolvulus althaeoides	.	.	.	.	+	1	1
Hyoseris radiata	.	.	.	.	1	2	2
Lathyrus articulatus	1	.	+	.	.	.	.
Ferula communis	1	+	.	.	.	.	.
Kundmannia sicula	2	1	.	.	.	.	.
Char. Class (*LYGEO-STIPETEA*)							
Asphodelus ramosus	2	2	1	1	1	2	1
Reichardia picroides	1	+	.	.	2	1	+
Dactylis hispanica	+	.	.	.	2	2	1
Charybdis maritima	.	.	.	+	2	2	3
Carlina sicula	+	1	.	1	.	.	.
Pallenis spinosa	.	.	.	.	2	1	2
Bituminaria bituminosa	.	+	+	.	.	.	.
Verbascum sinuatum	.	.	.	.	1	2	.
Asphodeline lutea	+	.	.	.	.	.	.
Petrorhagia illyrica subsp. *haynaldiana*	.	+	.	.	.	.	.
Other species							
Trachynia distachya	+	+	1	.	.	.	.
Hypochoeris achyrophorus	+	+	+	.	.	.	.
Stipa capensis	1	1	.	1	.	.	.
Asparagus acutifolius	1	.	.	.	+	.	+
Leontodon tuberosus	.	.	.	.	1	+	1
Arisarum vulgare	.	.	.	.	2	2	1
Lotus edulis	+	+	.	.	.	.	.
Chamaerops humilis	1	.	.	1	.	.	.
Ruta chalepensis	2	+	.	.	.	.	.
Artemisia arborescens	1	1	.	.	.	.	.
Phagnalon rupestre subsp. *rupestre*	1	1	.	.	.	.	.
Prunus dulcis	1	1	.	.	.	.	.
Prasium majus	+	1	.	.	.	.	.
Asparagus albus	.	.	1	1	.	.	.
Euphorbia pinea	.	.	.	.	2	1	.
Carlina involucrata	.	.	.	.	2	1	.
Chiliadenus lopadusanus	.	.	.	.	.	1	+
Anthemis lopadusana	.	.	.	.	.	+	1
Trifolium arvense	.	.	.	+	.	.	.
Trifolium cherleri	.	.	.	+	.	.	.
Medicago minima	.	.	+	.	.	.	.
Coleostephus myconis	.	.	.	+	.	.	.
Vulpia ciliata	+	.	.	.	.	.	.
Ajuga iva	.	+	.	.	.	.	.
Linum trigynum	.	.	.	+	.	.	.
Sideritis romana	.	+	.	.	.	.	.
Galactites elegans	.	.	.	+	.	.	.
Silene gallica	.	.	.	1	.	.	.
Salvia verbenaca	.	+	.	.	.	.	.

Place and date of relevés
Rel. 1-2: Timp. Sapone, presso il Lago di Paceco. 21.III.2004
Rel. 3: C.da Borruso (Trapani), 30.III.2006
Rel. 4: Pietra Colle (Trapani), 1.V.2006
Rel.5-6: Cala Madonna (Lampedusa), 14.IV.2008
Rel.7: Vallone dell'Acqua (Lampedusa), 14.IV.2008

Table 21
A) ***Phagnalo annotici-Lygeetum sparti***
B) ***Lavatero agrigentinae-Lygeetum sparti***
C) ***Asteretum sorrentini***
D) ***Eryngio dichotomi-Lygeetum sparti***

Relevé	1	2	3	4	5	6	7	8	9	10	11	12
Altitude (mt a.s.l.)	40	50	60	500	400	400	250	260	260	170	175	180
Plot size (sq.m.)	100	100	100	100	20	20	50	10	10	100	100	100
Cover (%)	90	90	100	80	100	85	90	80	85	100	70	90
Slope (°)	25	30	30	30	10	35	10	-	10	40	25	25
Exposure	SE	S	S	SE	S	SE	SW	-	W	NE	N	N
Association	A	A	A	B	B	B	B	C	C	D	D	D
Char. Association												
Asparagus stipularis	+	+	.	.	.	.	.	.	.	.	.	.
Phagnalon rupestre subsp. *annoticum*	.	.	+	.	.	.	.	.	.	.	.	.
Lavatera agrigentina	.	.	.	1	+	1	2	.	.	.	.	.
Tripolium sorrentini	.	.	.	.	.	.	.	2	3	.	.	.
Char. Alliance (*MORICANDIO-LYGEION SPARTI*) and Order (*LYGEO-STIPETALIA*)												
Lygeum spartum	5	4	5	4	5	4	4	4	4	4	3	4
Eryngium dichotomum	.	.	.	.	.	1	1	.	.	1	1	+
Eryngium triquetrum	.	.	.	1	.	.	.	.	.	1	2	2
Capparis sicula	.	.	.	+	.	.	.	.	.	.	.	.
Moricandia arvensis	.	.	.	.	.	2	.	.	.	.	.	.
Char. Class (*LYGEO-STIPETEA*)												
Asphodelus ramosus	3	1	1	.	1	+	.	.	.	1	1	1
Charybdis maritima	2	1	2	.	.	+	.	.	.	+	+	+
Dactylis hispanica	1	+	1	.	.	+	.	.	.	1	+	1
Elaeoselinum meoides	.	.	.	.	.	.	.	.	.	2	4	3
Reichardia picroides	.	.	.	+	1	.	.	.	.	.	.	.
Carlina hispanica subsp. *globosa*	+	.	+	.	.	.	.	.	.	.	.	.
Thapsia garganica	.	.	+	.	.	+	.	.	.	.	.	.
Asphodeline lutea	.	.	.	.	.	.	+	.	.	.	.	+
Convolvulus althaeoides	2	.	.	.	.	.	.	.	.	.	.	.
Foeniculum piperitum	.	.	.	.	+	.	.	.	.	.	.	.
Pallenis spinosa	.	.	.	+	.	.	.	.	.	.	.	.
Other species												
Salsola oppositifolia	.	2	+	.	.	1	.	.	.	+	.	1
Loncomelos narbonense	.	.	.	.	1	+	.	.	.	+	+	.
Catananche lutea	.	.	.	.	.	+	.	.	.	+	+	1
Asparagus albus	.	.	.	.	.	+	.	.	.	1	+	+
Limoniastrum monopetalum	1	1	2	.	.	.	.	.	.	.	.	.
Sonchus oleraceus	.	.	.	.	2	.	.	1	+	.	.	.
Podospermum canum	.	.	.	2	.	.	.	2	2	.	.	.
Crepis vesicaria	.	.	.	.	.	+	.	2	1	.	.	.
Salsola agrigentina	.	.	.	.	.	.	1	2	1	.	.	.
Phlomis herba-venti	.	.	.	.	.	.	.	.	.	2	1	1
Tragopogon porrifolius	.	.	.	.	.	.	.	.	.	1	1	+
Bellevalia dubia	.	.	.	.	.	.	.	.	.	+	+	+
Daucus carota	.	.	.	.	.	.	.	.	.	+	+	+
Scorzonera deliciosa	+	.	+	.	.	.	.	.	.	.	.	.
Sueda vera	+	1	.	.	.	.	.	.	.	.	.	.
Artemisia arborescens	.	.	.	+	.	+	.	.	.	.	.	.
Ferula communis	.	.	.	1	.	1	.	.	.	1	.	.
Podospermum laciniatum	.	.	.	.	.	1	.	.	+	.	.	.
Beta maritima	.	.	.	.	.	.	.	+	+	.	.	.
Bromus intermedius	.	.	.	.	.	.	.	1	1	.	.	.
Parapholis pycnantha	.	.	.	.	.	.	.	1	1	.	.	.
Plantago coronopus	.	.	.	.	.	.	.	+	+	.	.	.
Sonchus asper	.	.	.	.	.	.	.	1	1	.	.	.
Anacamptis pyramidalis	.	.	.	.	.	.	.	.	.	.	+	+
Ornithogalum gussonei	+	.	.	.	.	.	.	.	.	.	.	.
Prasium majus	.	.	+	.	.	.	.	.	.	.	.	.
Euphorbia rigida	.	.	.	+	.	.	.	.	.	.	.	.
Echium italicum	.	.	.	+	.	.	.	.	.	.	.	.
Crepis hiemalis	.	.	.	.	.	.	.	+	.	.	.	.
Festuca arundinacea	.	.	.	.	.	.	.	.	+	.	.	.
Ammi visnaga	.	.	.	.	.	.	1	.	.	.	.	.
Allium arvense	.	.	.	.	.	.	1	.	.	.	.	.
Atriplex halimus	.	.	.	.	.	.	1	.	.	.	.	.

Place and date of relevés
Rel.1-3: Lido Rossello (Agrigento), 19.IV.2004
Rel.4: Corvillo, presso Casa Cantoniera, 10.V.2003
Rel.5: Agira, presso svincolo A19 (Enna), 11.V.2005
Rel.6: Assoro (Enna), 24.IV.2009
Rel.7: Maccalube d'Aragona (Agrigento), 21.VII.2009
Rel.8-9: Maccalube d'Aragona (Agrigento), 13.V.2009
Rel.10-12: C.da Cannizzola (Centuripe), 25.V.2009

Table 13
Avenulo cincinnatae-Stipetum barbatae

Relevé	1	2	3*	4	5	6	7	8	9	10	11
Altitude (mt a.s.l.)	##	##	##	##	##	##	##	##	##	##	##
Plot size (sq.m.)	10	10	5	10	15	5	10	10	10	50	50
Cover (%)	90	80	80	80	80	80	90	80	70	80	90
Slope (°)	10	15	10	20	15	10	10	5	10	10	10
Exposure	N	NW	N	S	SE	N	NW	N	S	S	S
Char. Association											
Stipa barbata	4	3	4	3	3	4	2	2	3	2	3
Char. Alliance (*AVENULO-AMPELODESMION MAURITANICI*)											
Scorzonera columnae	2	3	2	3	2	1	1	+	2	2	2
Avenula cincinnata	3	2	2	3	2	2	3	.	3	3	2
Ampelodesmos mauritanicus	3	2	2	3	2	2	.	2	.	.	.
Pimpinella anisoides	1	1	+	1	1	+	.	.	.	.	.
Dianthus graminifolius	.	+	1	+	+	.	.	.	.	.	.
Gypsophila arrostii	.	.	.	.	.	.	.	1	.	.	.
Char. Order (*HYPARRHENIETALIA HIRTAE*)											
Kundmannia sicula	1	+	1	2	.	+	.	.	1	+	+
Micromeria graeca	1	2	1	2	1	1	.	+	.	.	.
Carlina gummifera	.	.	.	.	1	1	+	.	.	+	+
Foeniculum piperitum	.	.	+	+	.	+	1	.	.	.	.
Char. Class (*LYGEO-STIPETEA*)											
Elaeoselinum meoides	2	1	2	1	1	1	2	1	1	1	2
Anthyllis vulneraria subsp. *maura*	2	2	2	2	3	2	2	.	1	+	+
Asphodelus ramosus	1	2	1	2	1	+	1	2	+	.	.
Convolvulus cantabrica	2	2	1	2	1	2	.	.	1	+	1
Dactylis hispanica	.	+	+	.	1	.	2	+	1	+	1
Asperula aristata subsp. *scabra*	1	1	1	2	2	1	.	+	.	.	.
Pallenis spinosa	.	+	+	.	.	.	+	.	1	+	1
Allium arvense	+	+	+	.	+	+	.	.	.	.	.
Sedum sediforme	.	.	+	.	+	1	.	.	1	.	+
Carlina hispanica subsp. *globosa*	+	.	.	+	.	+	1	.	.	.	.
Petrorhagia illyrica subsp. *haynaldiana*	1	1	1	1	.	.	.	.	.	.	.
Scabiosa atropurpurea	.	.	.	.	.	.	.	.	+	+	+
Bituminaria bituminosa	.	.	.	.	.	.	+	1	.	.	.
Allium sphaerocephalon	.	.	.	.	.	.	+	+	.	.	.
Asphodeline lutea	.	.	.	.	+	.	.	.	.	+	.
Charybdis maritima	.	.	.	.	.	.	1	.	.	+	.
Galium lucidum	.	.	.	.	.	.	+	.	.	.	.
Centaurea nicaeensis	.	.	.	.	.	.	.	.	.	.	1
Other species											
Eryngium campestre	.	1	+	2	1	2	.	.	1	1	1
Petrorhagia saxifraga subsp. *gasparrini*	.	.	+	1	2	2	.	.	+	+	1
Koeleria splendens subsp. *splendens*	2	2	1	2	2	2	.	.	.	.	.
Thymus spinulosus	+	+	+	+	+	.	.	.	.	.	1
Carduncellus pinnatus	1	+	.	.	+	.	.	.	+	1	+
Dasypyrum villosum	.	.	.	.	.	.	+	+	1	+	1
Tolpis virgata	+	+	+	.	+	.	.	.	.	.	.
Helianthemum cinereum	.	.	1	.	.	.	.	.	1	1	.
Allium lehmannii	.	.	.	.	.	.	.	.	+	+	+
Centaurea parlatoris	.	.	.	.	.	.	.	.	2	2	1
Helianthemum nummularium	.	.	.	.	.	.	.	.	1	3	2
Plantago serraria	.	.	.	.	.	.	.	.	1	1	1
Lagurus ovatus	.	.	.	.	.	.	.	.	1	+	1
Avena barbata	.	.	.	.	.	.	.	.	1	1	1
Cachrys sicula	.	.	.	.	.	.	.	.	+	1	.
Sedum gypsicola	.	.	.	.	.	.	1	+	.	.	.
Teucrium fruticans	.	.	.	.	.	.	1	2	.	.	.
Scolymus grandiflorus	.	.	.	.	.	.	.	.	+	1	.
Salvia verbenaca	.	.	.	.	.	.	.	.	.	+	+
Inula montana	.	.	.	1	.	.	.	.	.	.	.
Matthiola fruticulosa subsp. *fruticulosa*	.	.	.	.	.	.	.	+	.	.	.
Diplotaxis crassifolia	.	.	.	.	.	.	.	+	.	.	.
Ruta chalepensis	.	.	.	.	.	.	.	.	+	.	.
Carthamus lanatus	.	.	.	.	.	.	.	.	.	.	+
Sinapis pubescens	.	.	.	.	.	.	.	.	.	.	1

Place and date of relevés
Rel. 1-6: Monte D'Indisi, Filaga (Palermo), 10.VI.1995
Rel. 7-8: Serre di Ciminna (Palermo), 16.VI.2004
Rel. 9-11: Monte Inici (Palermo), 14.VI.2006

Table 15
A) ***Coronillo glaucae-Brachypodietum retusi***
B) ***Helminthotheco aculeatae-Brachypodietum retusi***
C) ***Diantho graminifoli-Brachypodietum retusi***
D) ***Cachryo siculae-Brachypodietum retusi***

Relevé	1	2	3	4	5	6*	7	8	9	10	11	12	13	14	15	16	17	18	19*	20
Altitude (mt a.s.l.)	##	##	##	##	70	##	##	##	##	##	##	##	##	##	##	30	20	25	60	50
Plot size (sq.m.)	##	50	10	##	20	25	50	25	##	##	50	50	##	##	##	50	##	20	50	50
Cover (%)	90	75	60	##	95	90	90	80	70	70	80	##	90	##	##	90	90	90	80	70
Slope (°)	40	40	30	20	20	30	30	20	40	30	20	20	20	20	10	20	40	20	10	10
Exposure	E	NE	N	NNE	N	WNW	WNW	W	ENE	NE	NW	NW	NW	NNE	SW	NW	N	NNW	N	N
Association	A	A	B	B	B	C	C	C	C	C	C	C	D	D	D	D	D	D	D	D
Char. Association																				
Coronilla valentina subsp. *glauca*	+	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Helminthotheca aculeata	.	.	+	1	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Dianthus graminifolius	.	.	.	.	.	2	1	1	1	1	2	1	.	.	.	.	.	.	.	.
Cachrys sicula	.	.	.	.	.	.	.	.	.	.	.	.	+	+	+	1	1	2	2	1
Char. Alliance (*BROMO-ORYZOPSION MILIACEAE*)																				
Brachypodium retusum	2	4	2	5	5	4	5	4	4	4	4	5	5	3	2	4	4	4	4	3
Char. Order (*HYPARRHENIETALIA HIRTAE*)																				
Ampelodesmos mauritanicus	1	.	.	+	1	2	+	+	2	1	1	1	1	1	.	.	.	.	1	+
Kundmannia sicula	.	.	+	1	2	1	1	+	2	3	2	+	.	1	.	.	.	1	1	1
Hyoseris radiata	.	+	1	.	+	+	+	1	.	.	+	+	.	.	+	1	2	1	1	+
Foeniculum piperitum	.	.	.	+	.	.	+	+	1	+	1	+	+	+	.	.	.	.	+	1
Micromeria graeca	.	.	.	1	.	1	+	+	+	+	.	.	+	1	.	.	.	.	.	1
Ferula communis	+	1	.	.	.	.	+	1	1	1	.	.	.	+	+	.	.	.	.	.
Carlina gummifera	.	.	.	.	.	+	1	.	.	.	.	.	.	.	.	2	.	.	1	+
Phagnalon saxatile	.	+	.	.	.	.	.	.	.	.	+	+	.	.	.	.	.	.	.	1
Helictotrichon convolutum	.	.	.	1	.	.	.	.	.	.	.	.	1	1	.	.	.	.	.	.
Avenula cincinnata	.	.	.	.	.	.	.	.	+	1	.	1	.	.	.	.	.	.	.	.
Lathyrus articulatus	.	.	.	+	+	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.
Cachrys libanotis	.	.	.	+	.	+	.	.	.	+	.	.	.	.	.	.	.	.	.	.
Convolvulus althaeoides	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	1	+
Klasea flavescens subsp. *mucronata*	.	.	+	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.
Hypharrenia hirta	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.
Pimpinella anisoides	.	.	.	.	.	+	.	.	.	.	.	+	.	.	.	.	.	.	.	.
Char. Class (*LYGEO-STIPETEA*)																				
Dactylis hispanica	+	+	1	+	2	2	1	1	1	+	1	2	1	1	1	3	3	2	2	2
Carlina sicula	.	1	1	+	1	1	+	.	1	+	1	+	.	+	.	1	1	1	+	+
Bituminaria bituminosa	.	.	.	.	+	1	+	2	1	+	2	+	+	.	+	1	+	+	2	2
Anthyllis vulneraria subsp. *maura*	.	.	.	+	+	+	+	1	1	+	.	+	.	.	+	1	2	.	1	1
Asphodelus ramosus	.	.	1	.	2	.	.	.	1	+	1	1	.	+	.	1	1	.	2	1
Reichardia picroides	.	.	+	.	+	.	.	.	.	.	1	+	+	.	+	1	1	1	1	2
Pallenis spinosa	.	.	+	.	.	.	.	.	.	+	1	+	.	.	.	1	1	+	1	1
Centaurea nicaeensis	.	.	.	.	.	.	+	1	1	+	1	+	.	.	+	.	.	.	+	+
Charybdis maritima	.	.	.	+	.	.	+	.	1	+	.	.	+	.	+	.	.	.	1	2
Scabiosa atropurpurea	.	.	.	.	.	.	+	+	1	2	.	.	.	.	+	.	.	+	+	1
Convolvulus cantabrica	.	.	.	.	+	.	.	+	+	.	.	.	.	.	1	1	+	.	+	+
Scabiosa maritima	.	.	.	.	.	+	+	.	1	+	1	+	.	.	.	.	+	.	.	.
Thapsia garganica	.	.	.	.	+	.	.	.	+	+	.	.	.	.	.	.	+	1	1	1
Eryngium bocconei	.	.	.	.	+	.	.	.	1	1	.	+	.	.	+	+	.	.	.	.
Elaeoselinum meoides	.	.	1	.	.	.	+	.	.	.	2	1	.	.	.	.	.	.	.	.
Sanguisorba minor subsp. *minor*	.	.	.	+	.	.	.	1	.	.	.	.	+	.	.	.	.	.	.	.
Lobularia maritima	.	.	.	.	.	.	.	+	.	.	.	.	1	.	.	.	.	.	.	.
Galium lucidum	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	+
Petrorhagia illyrica subsp. *haynaldiana*	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.
Piptatherum miliaceum subsp. *miliaceum*	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.
Other species																				
Eryngium campestre	.	.	.	.	.	2	2	1	1	1	1	+	+	.	+	.	.	.	+	1
Avena barbata	.	+	.	+	.	.	1	1	.	.	+	+	1	1	1	.	.	.	+	+
Nigella damascena	.	.	.	+	.	1	1	.	1	+	.	.	+	+	+	.	.	.	.	.
Daucus carota	.	.	.	.	.	+	+	+	.	.	+	.	+	.	+	.	.	.	+	+
Lotus cytisoides	.	.	.	.	.	+	+	+	.	.	+	+	.	.	.	+	.	1	.	.
Scolymus grandiflorus	.	.	.	.	.	.	.	.	.	+	+	1	.	.	.	1	1	+	+	.
Asparagus acutifolius	.	.	.	.	.	.	.	.	.	+	+	+	1	+	.	.	.	.	+	+
Dasypyrum villosum	.	.	.	.	.	+	+	+	.	.	.	.	+	.	+	.	.	.	1	+
Linum strictum subsp. *strictum*	.	.	+	.	.	+	+	+	.	.	.	.	+	.	.	.	1	.	.	.
Briza maxima	.	.	.	+	.	.	.	.	+	+	.	.	+	.	+	.	.	+	.	.
Lagurus ovatus subsp. *ovatus*	.	.	.	.	.	.	+	1	.	.	+	.	+	.	1	.	.	+	.	.
Plantago serraria	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	2	2	+	1	+
Ruta chalepensis	+	1	.	+	.	.	.	.	1	+	.	.	.	.	.	.	.	.	.	.
Cistus eriocephalus	1	1	1	+	.	.	.	.	.	.	.	.	.	3	.	.	.	.	.	.
Micromeria fruticulosa	1	1	+	.	+	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.
Galium pallidum	.	.	.	.	.	.	.	.	.	+	1	+	.	+	1	.	.	.	.	.
Reseda alba	.	.	.	.	.	.	+	.	.	.	+	+	.	.	.	.	+	.	+	.
Osyris alba	.	.	.	+	.	.	.	.	1	1	.	.	.	.	.	.	.	.	1	+
Silene coeli-rosa	.	.	.	+	.	+	1	+	.	.	.	.	.	.	.	.	.	.	.	.
Allium lehmannii	.	.	.	.	.	1	+	+	.	+	.	.	.	.	.	.	.	.	.	.
Arisarum vulgare	1	+	.	1	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.
Scorzonera hirsuta	.	.	.	.	+	.	.	.	.	+	.	.	.	.	.	+	.	+	.	.
Trifolium campestre	.	.	.	.	.	+	+	+	.	.	.	.	.	.	+	.	.	.	.	.
Teucrium fruticans	.	.	.	+	.	.	.	.	.	.	1	+	.	1	.	.	.	.	.	.
Galactites elegans	.	.	.	1	.	.	+	+	.	.	.	.	.	.	+	.	.	.	.	.
Hedypnois rhagadialoides	.	.	.	.	.	+	+	+	.	.	.	.	.	.	.	.	.	.	.	.
Gladiolus communis subsp. *byzantinus*	.	.	.	.	.	.	.	.	.	.	.	.	+	+	+	.	.	.	.	.
Scorzonera deliciosa	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	1	.	+	.	.
Sonchus oleraceus	.	.	.	.	.	.	.	.	.	.	.	.	1	1	1	.	.	.	.	.
Euphorbia pinea	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	1	+	.	.

Place and date of relevés
Rel.1: Pendio che scende da Nido Falcone a Chiappara (Marettimo), 17.IX.2002
Rel.2: Carcaredda (Marettimo), 2.V.2004
Rel.3: Fra Pizzo Sella e M. Monaco, presso S. Vito Lo Capo (Trapani), 1.V.2006
Rel.4: Montagna Grande di Salemi, versante nord-occidentale (Trapani), 20.V.2006
Rel.5: Monte Cofano, versante settentrionale, 8.V.2007
Rel.6-7: Montagna dei Rizzi, C.da Agnone di M. Grande di Salemi (Trapani), 13.VI.2006
Rel.8: Montagna Grande di Salemi, rimboschimenti sopra C.da Kinea (Trapani), 14.VI.2006
Rel.9-10: Complesso di Montagna Grande, Monte Agnone, contrada Balatizzo (Trapani), 12.VI.2004
Rel.11-12: Erice, presso i ruderi del Semaforo (Trapani), 14.VI.2006
Rel.13-14: Montagna Grande di Salemi, versante nord-occidentale (Trapani), 20.V.2006
Rel.15: Montagna Grande di Salemi, C.da Cumuna (Trapani), 20.V.2006
Rel.16-17: Monte Cofano, presso la Torre di C.da Frassino, 8.V.2007
Rel.18: Capo Gallo (Palermo), 8.V.2007
Rel.19-20: Monte Cofano (Trapani), 8.V.2007

Table 5
Cachryo pungentis-Hyparrhenietum hirtae

Relevé	1	2	3	4	5	6*	7	8	9	10	11
Altitude (mt a.s.l.)	200	220	240	240	250	240	240	240	240	350	100
Plot size (sq.m.)	25	25	25	30	30	50	50	50	50	50	20
Cover (%)	80	90	80	90	100	80	80	100	100	90	90
Char. Association											
Cachrys pungens	2	3	3	2	2	2	3	3	2	1	2
Char. Alliance (*HYPARRHENION HIRTAE*) and Order (*HYPARRHENIETALIA HIRTAE*)											
Hyparrhenia hirta	4	4	3	4	4	4	4	5	5	3	2
Convolvulus althaeoides	1	+	1	.	1	.	.	.	.	2	+
Lathyrus articulatus	.	+	+	.	.	+	.	+	.	1	.
Carlina gummifera	.	.	.	.	.	1	1	2	1	.	.
Andropogon distachyos	.	.	.	.	.	1	1	+	+	.	.
Phagnalon saxatile	.	.	+	1	1	.	.	.	.	.	.
Foeniculum piperitum	.	.	.	.	.	.	.	.	.	1	1
Char. Class (*LYGEO-STIPETEA*)											
Asphodelus ramosus	1	1	2	1	1	2	2	2	1	2	.
Charybdis maritima	+	1	1	1	2	1	2	2	1	+	.
Thapsia garganica	1	1	+	1	2	1	1	2	1	.	.
Anthyllis vulneraria subsp. *maura*	1	1	2	2	1	.	.	.	.	1	.
Dactylis hispanica	.	.	.	.	.	2	+	2	1	.	.
Hypericum perforatum	.	.	.	.	.	+	+	+	+	.	.
Lobularia maritima	.	+	+	.	1	.	.	.	.	.	.
Pallenis spinosa	.	.	.	.	.	.	.	.	.	1	+
Verbascum sinuatum	.	.	.	.	.	.	.	.	.	+	+
Scabiosa maritima	.	.	.	.	.	.	.	.	.	.	2
Reichardia picroides	.	.	.	.	.	.	.	.	.	.	1
Carlina hispanica subsp. *globosa*	.	.	.	.	.	.	.	.	.	2	.
Elaeoselinum meoides	.	.	.	.	.	.	.	.	.	+	.
Bituminaria bituminosa	.	.	.	.	.	.	.	.	.	1	.
Other species											
Cistus salviifolius	1	2	2	1	2	1	1	+	1	.	.
Serapias parviflora	.	.	.	.	.	+	.	+	+	.	.
Asparagus acutifolius	+	.	+	.	.	.	.	.	.	.	.
Ranunculus palustris	.	.	.	.	.	+	.	+	.	.	.
Cistus creticus	.	.	.	.	.	+	.	.	1	.	.
Eryngium campestre	.	.	.	.	.	.	.	.	.	+	2
Hypericum triquetrifolium	.	.	.	.	.	.	.	.	.	.	3
Allium sp.	.	.	.	.	.	.	.	.	.	.	+
Piptatherum miliaceum subsp. *miliaceum*	.	.	.	.	.	.	.	.	.	.	1
Scolymus hispanicus	.	.	.	.	.	.	.	.	.	.	+
Verbena officinalis	.	.	.	.	.	.	.	.	.	.	1
Daucus carota	.	.	.	.	.	.	.	.	.	.	+
Dittrichia viscosa	.	.	.	.	.	.	.	.	.	.	1
Ononis ramosisima	.	.	.	.	.	.	.	.	.	1	.
Stipa capensis	.	.	.	.	.	.	.	.	.	1	.
Lotus ornithopodioides	.	.	.	.	.	.	.	.	.	1	.
Salvia verbenaca	.	.	.	.	.	.	.	.	.	+	.

Place and date of relevés
Rel.1-5: C.da Pisciotto (Niscemi), 15.IV.1998
Rel.6-9: Bosco di Santo Pietro (Caltagirone), 14.IV.2007

Table 12
A) *Avenulo cincinnatae-Stipetum siculae matthioletosum fruticulosae*
B) *Avenulo cincinnatae-Stipetum siculae hyparrhenietosum hirtae*

Relevé	1	2	3	4	5	6*	7	8	9	10	11	12*
Altitude (mt a.s.l.)	780	800	800	830	850	850	850	500	500	550	560	560
Plot size (sq.m.)	20	20	30	20	20	10	20	10	10	5	5	10
Cover (%)	80	80	90	90	70	90	80	90	80	90	70	70
Subassociation	A	A	A	A	A	A	A	B	B	B	B	B
Char. Association												
Stipa sicula	4	3	3	4	2	3	3	2	2	3	3	2
Char. subassociation												
Matthiola fruticulosa subsp. *fruticulosa*	2	2	1	1	2	2	2	.	.	.	.	.
Koeleria splendens subsp. *splendens*	.	+	+	.	1	2	1	.	.	.	.	.
Char. Alliance (*AVENULO-AMPELODESMION MAURITANICI*)												
Avenula cincinnata	2	3	3	2	2	3	3	1	2	2	2	2
Ampelodesmos mauritanicus	2	2	2	2	1	3	2	1	2	1	1	2
Scorzonera columnae	1	1	+	1	1	2	1	2	2	1	1	2
Pimpinella anisoides	1	2	1	2	2	1	2	.	.	.	+	.
Dianthus graminifolius	.	+	+	1	1	1	2	.	.	.	.	.
Gypsophila arrostii	+	.	+	1	.	.	.	1	+	.	1	.
Char. Order (*HYPARRHENIETALIA HIRTAE*)												
Micromeria graeca	2	2	2	2	2	2	2	.	.	.	.	.
Foeniculum piperitum	.	.	1	.	.	.	.	+	1	.	+	+
Cachrys libanotis	.	.	.	.	.	.	.	1	+	2	2	1
Hyparrhenia hirta	.	.	.	.	.	.	.	3	3	2	2	3
Phagnalon saxatile	.	.	.	.	.	.	.	1	+	1	1	1
Andropogon distachyos	.	.	.	.	.	.	.	1	1	+	+	+
Hyoseris radiata	.	.	.	.	1	+	.	.	.	.	.	.
Char. Class (*LYGEO-STIPETEA*)												
Asphodelus ramosus	2	2	3	2	1	1	2	2	1	2	2	1
Asperula aristata subsp. *scabra*	+	1	1	1	1	2	1	+	1	.	+	+
Pallenis spinosa	+	+	1	2	+	+	+	1	.	+	1	1
Dactylis hispanica	2	2	2	2	+	2	2	1	1	1	.	.
Anthyllis vulneraria subsp. *maura*	2	1	2	1	1	2	1	.	1	+	+	.
Asphodeline lutea	1	1	1	+	1	1	2	.	+	.	1	.
Reichardia picroides	2	1	1	1	1	+	+	.	.	.	.	.
Charybdis maritima	.	+	+	.	.	+	.	+	1	.	.	+
Convolvulus elegantissimus	.	.	.	.	.	.	.	2	1	2	1	1
Sedum sediforme	.	.	.	.	.	.	.	+	1	+	+	1
Convolvulus cantabrica	.	+	1	1	.	1	.	.	.	.	.	1
Allium arvense	+	+	+	.	.	+	1	.	.	.	.	.
Bituminaria bituminosa	.	.	.	.	.	.	.	+	1	.	1	.
Carlina sicula	.	.	.	.	1	+	1	.	.	.	.	.
Other species												
Fumana thymifolia	.	.	.	.	.	.	.	1	+	1	1	+
Thymus spinulosus	+	+	.	.	1	+	1	.	.	.	.	.
Euphorbia rigida	+	+	.	+	1	1	.	.	.	.	.	.
Teucrium capitatum	.	.	.	.	.	.	.	1	1	1	1	1
Thymbra capitata	2	2	1	1	.	.	.	.	.	.	.	.
Inula montana	.	1	+	2	.	.	.	.	.	.	.	.
Silene sicula	.	.	.	.	1	1	.	.	.	.	.	.
Tolpis virgata	+	.	+	.	.	.	.	.	.	.	.	.
Cistus salviifolius	.	.	.	.	.	.	.	1	.	.	.	.
Petrorhagia saxifraga	.	.	.	.	.	.	.	+	.	.	.	.
Carduncellus pinnatus	.	.	+	.	.	.	.	.	.	.	.	.

Place and date of relevés
Rel. 1-7: Gangi (Palermo), 5.VII.1994
Rel. 8-12: Leonforte (Enna), 9.VI.1993

Table 1 - Synoptic table of the *Hyparrhenion hirtae* in Sicily

Association	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27
Number of relevés	3	8	3	4	24	11	2	3	12	7	11	8	6	7	10	7	7	3	8	6	2	8	6	9	17	1	7
Char. Association																											
Ferula communis	2	.	2	2	V	V	2	3	.	.	.	.	.	.	II	.	IV	.	.	.	.	.	.	I	II	.	V
Ferulago nodosa	.	.	.	.	.	.	.	.	V	V	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Cachrys pungens	.	.	.	.	.	.	.	.	.	.	V	.	.	.	.	III	.	.	.	.	.	.	.	.	.	.	.
Euphorbia terracina	.	.	.	.	.	.	.	.	.	.	.	V	.	.	.	V	.	.	.	.	.	.	.	.	.	.	.
Piptatherum miliaceum subsp. *pauciflorum*	.	.	.	.	.	.	.	.	.	.	.	.	V	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Allium pallens	.	.	.	.	.	.	.	.	.	.	.	.	IV	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Sanguisorba verrucosa	.	.	.	.	.	.	.	.	II	.	.	.	.	V	.	.	.	.	.	.	.	.	.	.	.	.	.
Magydaris pastinacea	.	.	.	.	.	.	.	.	.	.	.	.	.	V	.	.	.	.	.	.	.	.	.	.	.	.	.
Festuca humifusa	.	.	.	.	.	.	.	.	.	.	.	.	.	.	V	.	.	.	.	.	.	.	.	.	.	.	.
Stipa gussonei	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	V	.	.	.	.	.	.	.	.	.	.	.
Echinophora tenuifolia	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	III	.	.	.	.	.	.	.	.	.	.	.
Thapsia pelagica	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	IV	3	.	.	.	.	.	.	.	.	.
Daucus siculus	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	I	.	.	.	.	.	.	.	.	.	.
Imperata cylindrica	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	V	.	.	.	.	.	.	.	.
Dichanthium annulatum	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	V	.	.	.	.	.	.	.
Phalaris coerulescens	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	2	.	.	.	.	.	.
Bothriochloa insculpta subsp. *panormitana*	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	V	1	.
Megathyrsus bivonianus	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	V	.	.
Char. Suballiance (*PANICO-HYPARRHENENION HIRTAE*)																											
Panicum repens	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	V	V	2	.	.	.	.	.	.
Char. Suballiance (*ARISTIDO-HYPARRHENENION HIRTAE*)																											
Tricholaena teneriffae	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	V	.	.	.	.	.
Cenchrus ciliaris	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	V	V	III	.	.
Heteropogon contortus	.	.	.	.	I	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	IV	V	.	V
Pennisetum setaceum	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	V	.	V
Aristida caerulescens	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	I	.	.
Char. Alliance (*HYPARRHENION HIRTAE*) and Order (*HYPARRHENIETALIA HIRTAE*)																											
Hyparrhenia hirta	3	V	3	4	V	V	2	3	V	V	V	V	V	.	V	V	.	3	V	V	2	V	V	V	V	1	V
Foeniculum piperitum	.	V	1	1	IV	V	2	3	IV	V	I	.	I	V	.	.	V	3	II	V	1	.	V	.	I	1	III
Phagnalon saxatile	3	III	3	2	I	IV	.	.	III	I	II	V	IV	V	V	.	V	3	.	.	.	II	V	I	IV	.	IV
Convolvulus althaeoides	3	V	.	.	II	II	1	3	III	II	III	.	V	V	I	.	V	3	.	.	.	V	V	I	IV	.	V
Lathyrus articulatus	2	IV	3	2	III	V	.	.	III	II	III	IV	I	.	.	III	.	.	.	.	.	IV	IV	.	IV	.	V
Andropogon distachyos	3	V	3	4	IV	.	.	.	II	IV	II	.	.	.	IV	.	.	.	III	.	.	.	.	.	V	.	III
Micromeria graeca	3	V	3	3	III	.	1	.	V	V	.	.	.	.	V	.	.	.	.	.	.	II	.	.	.	.	IV
Hyoseris radiata	.	.	1	.	.	.	.	.	II	.	.	.	I	IV	V	.	II	3	.	.	.	.	.	.	III	.	II
Carlina gummifera	.	.	.	.	III	.	.	.	.	II	II	.	.	.	.	II	.	.	.	.	.	.	.	.	.	.	III
Hyparrhenia sinaica	.	.	.	.	.	.	.	.	.	.	.	.	.	V	.	.	.	.	.	.	.	IV	.	.	IV	.	.
Kundmannia sicula	.	.	1	2	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	II
Cachrys libanotis	.	II	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Char. Class (*LYGEO-STIPETEA*)																											
Reichardia picroides	3	IV	2	2	IV	V	.	3	II	III	I	.	V	III	II	.	V	3	IV	V	1	V	V	II	V	.	IV
Charybdis maritima	3	.	1	1	III	I	2	3	III	III	V	III	V	IV	III	IV	IV	.	II	V	.	.	I	I	III	.	III
Asphodelus ramosus	3	IV	3	4	V	.	2	3	IV	III	V	.	V	.	.	V	V	3	V	V	.	.	II	I	IV	1	III
Dactylis hispanica	3	.	3	1	IV	.	.	.	IV	V	II	.	V	V	V	IV	IV	3	II	V	.	IV	V	.	IV	1	V
Lobularia maritima	3	.	2	2	II	V	.	3	II	.	II	V	.	V	V	.	IV	3	.	.	.	V	V	IV	IV	.	III
Pallenis spinosa	3	II	1	.	II	.	.	.	II	III	.	.	V	V	II	III	V	3	IV	V	.	.	.	.	III	.	IV
Bituminaria bituminosa	.	IV	2	2	III	.	1	3	IV	IV	I	.	.	.	V	.	.	.	.	.	1	.	IV	V	V	.	V
Verbascum sinuatum	.	III	2	.	II	.	.	.	I	.	I	.	.	III	.	.	I	2	V	V	.	.	IV	I	.	.	V
Thapsia garganica	2	II	.	.	III	.	1	.	.	.	IV	.	.	.	II	I	.	.	V	.	.	.	.	.	III	1	.
Carlina hispanica subsp. *globosa*	.	.	.	.	V	.	.	3	II	V	I	.	.	.	IV	.	.	.	.	V	.	V	IV	.	.	.	.
Piptatherum miliaceum subsp. *miliaceum*	.	.	3	.	.	.	.	.	II	II	I	.	.	III	.	.	IV	.	.	.	.	.	.	.	.	.	III
Anthyllis vulneraria subsp. *maura*	.	II	1	.	II	.	.	.	.	.	III	.	.	.	IV	III	.	.	.	.	.	.	.	.	.	.	.
Calamintha nepeta	.	III	.	.	II	.	.	.	II	II	.	.	.	.	.	.	.	.	.	.	.	IV	.	.	.	.	V
Centaurea nicaeensis	.	III	.	.	.	.	.	.	I	II	.	.	.	.	.	.	.	.	II	V	.	III	.	.	.	.	.
Scabiosa maritima	.	.	.	.	I	.	.	.	IV	V	I	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	III
Allium sphaerocephalon	.	.	.	.	I	.	.	.	.	.	.	.	.	.	II	I	.	.	.	.	.	.	.	.	II	.	.
Ampelodesmos mauritanicus	.	.	.	.	II	.	.	.	.	.	.	.	.	.	IV	.	.	.	.	.	.	.	.	I	.	.	I
Asphodeline lutea	.	.	1	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	II	.	III
Convolvulus elegantissimus	.	.	1	.	II	.	.	.	.	I	.	.	.	.	.	III	.	.	.	.	.	.	.	.	.	.	.
Gypsophila arrostii	.	.	.	.	I	.	1	3	.	III	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Sedum sediforme	.	.	1	.	.	.	.	.	.	.	.	.	IV	.	II	.	.	.	.	.	.	.	.	.	I	.	.
Brachypodium retusum	3	III	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	IV
Elaeoselinum meoides	.	.	.	.	II	.	.	.	.	II	I	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Galium lucidum	.	.	.	.	.	.	.	.	IV	III	.	.	.	.	V	.	.	.	.	.	.	.	.	.	.	.	.
Hypericum perfoliatum	3	.	.	.	.	.	.	.	I	III	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Hypericum perforatum	.	.	.	.	I	.	.	.	I	.	II	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Sanguisorba minor subsp. *minor*	.	.	.	.	II	.	.	.	.	II	.	.	.	.	.	I	.	.	.	.	.	.	.	.	.	.	.
Asperula aristata subsp. *scabra*	.	.	.	.	.	.	.	.	I	III	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Calendula suffruticosa subsp. *fulgida*	.	.	.	.	.	.	.	.	.	III	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.
Carlina sicula	.	.	.	3	.	.	.	.	.	.	.	.	.	.	.	I	.	.	.	.	.	.	.	.	.	.	.
Convolvulus cantabrica	.	.	.	.	I	.	.	.	.	.	.	.	.	.	.	I	.	.	.	.	.	.	.	.	.	.	.
Dittrichia viscosa	.	.	.	.	.	.	.	2	.	.	I	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Allium arvense	.	.	.	.	.	.	.	.	.	.	.	.	.	.	I	.	.	.	.	.	.	.	.	.	.	.	.
Cachrys sicula	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	III	.	.	.	.	.	.	.	.	.	.	.
Lygeum spartum	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	I	.	.	.	.	.	.	.	.
Micromeria consentina	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	I	.	.	.	.
Ornithogalum gussonei	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	II	.	.	.	.	.	.	.	.	.	.	.
Petrorhagia illyrica subsp. *haynaldiana*	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Pimpinella anisoides	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	III	.	.	.	.	.	.	.	.	.	.	.
Scorzonera columnae	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	I	.	.	.	.	.	.	.	.	.	.	.
Scabiosa atropurpurea	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	III	.	.	.	.	.	.	.	.	.	.	.

1 - *Hyparrhenietum hirto-pubescentis* (after Brullo & Di Martino 1974, tab.18)
2 - *Hyparrhenietum hirto-pubescentis* (after Bartolo et al. 1982, tab.16)
3 - *Hyparrhenietum hirto-pubescentis* (after Brullo et al. 1993, tab.5)
4 - *Hyparrhenietum hirto-pubescentis* (tab.2A)
5 - *Ferulo communis-Hyparrhenietum hirtae*(tab.3)
6 - *Ferulo communis-Hyparrhenietum hirtae* (after Brullo & Siracusa 1996, tab.5)
7 - *Ferulo communis-Hyparrhenietum hirtae* (after Bazan et al. 2006, tab.5)
8 - *Ferulo communis-Hyparrhenietum hirtae* (after Minissale et al. 2006, tab.9)
9 - *Ferulago nodosae-Hyparrhenietum hirtae* (tab.4)
10 - *Ferulago nodosae-Hyparrhenietum hirtae* (after Minissale et al. 2007, tab.16)
11 - *Cachryo pungentis-Hyparrhenietum hirtae* (tab.5)
12 - *Euphorbio terracinae-Hyparrhenietum hirtae* (after Brullo & Siracusa 1996, tab.4)
13 - *Oryzopsio pauciflorae-Hyparrhenietum hirtae* (after Bartolo et al. 1990, tab.13)
14 - *Sanguisorbo verrucosae-Magydaretum pastinaceae* (after Bartolo et al. 1990, tab.14)
15 - *Hyparrhenio hirtae-Festucetum humifusae* (tab.6)
16 - *Stipo gussonei-Hyparrhenietum hirtae* (tab.7A)
17 - *Thapsietum pelagicae* (after Bartolo et al. 1990, tab.16)
18 - *Thapsietum pelagicae* (tab.2B)
19 - *Imperato cylindricae-Hyparrhenietum hirtae* (after Brullo & Siracusa 2000, tab.15)
20 - *Dicanthio annulati-Hyparrhenietum hirtae* (after Brullo & Siracusa 2000, tab.16)
21 - *Phalarido coerulescentis-Hyparrhenietum hirtae* (tab.7C)
22 - *Tricholaeno teneriffae-Hyparrhenietum hirtae* (after Brullo et al. 1997, tab.2, ril.23-31)
23 - *Cenchro ciliaris-Hyparrhenietum hirtae* (after Brullo et al. 1997, tab.1, ril. 24-29)
24 - *Cenchro ciliaris-Hyparrhenietum hirtae* (after Minissale et al. 2006, tab.8 ril.1-9)
25 - *Bothriochloo panormitanae-Hyparrhenietum hirtae* (after Brullo et al. 1997, tab.5)
26 - *Botriochloo panormitanae-Hyparrhenietum hirtae* (tab.7B)
27 - *Penniseto setacei-Hyparrhenietum hirtae* (after Gianguzzi et al. 1996, tab.10)

Table 19
Euphorbio ceratocarpae-Arundinetum collinae

Number	1	2	3	4	5	6	7	8	9*	10	11	12	13	14	15	16	17	18
Altitude (m a.s.l.)	280	280	280	300	90	110	160	355	465	400	420	465	450	450	460	380	380	390
Surface (sq.m.)	100	100	100	100	50	100	40	100	50	50	60	100	50	50	100	50	100	30
Cover (%)	100	100	100	80	100	100	100	100	100	100	100	90	90	100	100	100	100	100
Slope (°)	45	60	60	50	50	60	60	60	20	40	30	10	-	-	10	25	30	25
Exposure	ESE	ENE	ENE	ESE	SW	W	NW	W	ESE	NE	SW	SW	-	-	S	E	SE	E
Char. Association																		
Euphorbia ceratocarpa	1	1	1	1	3	2	2	3	2	2	2	2	+	2	1	1	2	3
Char. Alliance (*ARUNDION COLLINAE*)																		
Arundo collina	5	5	5	3	4	4	4	4	5	5	4	5	4	5	5	4	5	4
Char. Order (*HYPARRHENIETALIA HIRTAE*) and Class (*LYGEO-STIPETEA*)																		
Foeniculum piperitum	+	+	+	.	.	.	+	1	1	1	+	+	3	2	1	1	1	1
Dittrichia viscosa	2	2	2	1	.	.	.	1	1	1	1	.	.	+	+	.	.	+
Ferula communis	.	.	.	.	1	1	1	+	+	.	.	.	1	+	+	1	+	+
Dactylis hispanica	.	.	.	.	+	.	+	+	+	.	.	.	3	2	2	2	2	1
Ampelodesmos mauritanicus	.	.	.	.	.	.	.	+	+	.	1	1	1	1	1	+	+	1
Bituminaria bituminosa	.	.	+	.	+	.	.	.	.	.	+	.	2	3	2	2	1	1
Piptatherum miliaceum subsp. *miliaceum*	.	.	.	.	1	2	.	.	.	+	.	.	+	+	1	.	.	+
Pallenis spinosa	.	.	.	.	.	.	.	+	.	.	.	.	2	1	+	+	1	+
Reichardia picroides	.	.	.	.	.	.	.	.	.	.	.	.	1	1	+	1	1	1
Hypericum perfoliatum	.	.	1	.	.	1	1	1	+	.	.	.	.	.	.	.	.	.
Lathyrus articulatus	+	.	.	.	.	.	.	.	.	+	.	.	1	+	+	.	.	.
Scabiosa maritima	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	3	2	2
Hypericum perforatum	.	.	.	.	.	.	+	.	.	.	.	.	.	+	+	.	.	.
Carlina hispanica subsp. *globosa*	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	+	+
Verbascum sinuatum	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	+	+
Hyoseris radiata	.	.	.	.	.	.	.	.	.	.	.	.	+	+	.	.	.	.
Calamintha nepeta	.	.	.	.	.	.	.	.	.	.	.	.	.	+	+	.	.	.
Centaurea nicaeensis	.	.	.	.	.	.	.	.	.	.	.	.	1	+	.	.	.	.
Gypsophila arrostii	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	+	.
Carlina gummifera	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	+
Convolvulus althaeoides	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.
Kundmannia sicula	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.
Elaeoselinum meoides	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.
Sanguisorba minor	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.
Scabiosa atropurpurea	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.
Asphodelus ramosus	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.
Thapsia garganica	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.
Other species																		
Rubus ulmifolius	+	+	.	.	1	1	2	+	+	1	1	.	.	.	.	.	.	.
Asparagus acutifolius	.	.	+	.	.	.	+	+	.	.	.	1	+	+	+	+	+	.
Acanthus mollis	.	.	.	.	2	3	1	2	.	.	.	.	.	1	1	1	+	+
Spartium junceum	+	+	+	.	1	.	.	1	1	1	+	.	.	.	.	.	.	.
Rubia peregrina	1	1	+	+	.	.	.	.	.	+	+	1	.	.	.	.	.	.
Hypericum hircinum subsp. *majus*	2	1	1	3	.	.	.	.	.	+	1	.	.	.	.	.	.	.
Eryngium campestre	.	.	.	.	.	.	.	.	.	.	.	.	1	+	+	1	1	+
Daucus carota	.	.	.	.	.	.	.	.	.	.	.	.	2	2	2	2	1	1
Centranthus ruber	.	.	.	1	+	+	.	+	.	+	.	.	.	.	.	.	.	.
Bupleurum fruticosum	1	+	+	.	.	.	+	+	.	.	.	.	.	.	.	.	.	.
Centaurium erythraea subsp. *majus*	.	.	+	+	.	.	+	+	+	.	.	.	.	.	.	.	.	.
Opoponax chironium	.	.	.	.	+	.	+	1	1	1	.	.	+	.	1	.	.	.
Calicotome infesta	.	.	.	.	1	+	+	.	.	+	+	.	.	.	.	.	.	.
Calystegia sylvatica	.	.	.	.	.	1	+	+	1	1	.	.	.	.	.	.	.	.
Picris hieracioides	.	.	.	.	.	.	+	+	+	.	.	.	.	+	+	.	.	.
Nerium oleander	1	+	+	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Eupatorium cannabinum	+	.	.	+	.	.	.	.	.	+	+	.	.	.	.	.	.	.
Quercus virgiliana	.	.	.	.	+	.	1	1	.	+	.	.	.	.	.	.	.	.
Scolymus grandiflorus	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	+	1	+
Fraxinus oxycarpa	2	+	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Teucrium flavum	+	.	+	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Ulmus minor	.	.	.	.	.	.	+	1	.	.	+	.	.	.	.	.	.	.
Cytisus villosus	.	.	.	.	.	.	1	1	.	+	.	.	.	.	.	.	.	.
Avena sterilis	.	.	.	.	.	.	.	.	.	.	.	.	1	1	+	.	.	.
Allium sardoum	.	.	.	.	.	.	.	.	.	.	.	.	+	+	+	.	.	.
Phalaris canariensis	.	.	.	.	.	.	.	.	.	.	.	.	1	+	+	.	.	.
Vicia villosa	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	2	1
Cirsium scabrum	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	+	+
Salix gussonei	2	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Pteris vittata	2	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Tussilago farfara	.	.	.	1	.	.	.	.	.	.	+	.	.	.	.	.	.	.
Pulicaria odora	.	.	.	.	.	.	+	1	.	.	.	.	.	.	.	.	.	.
Brachypodium sylvaticum	.	.	.	.	.	.	1	+	.	.	.	.	.	.	.	.	.	.
Lavatera olbia	.	.	.	.	.	.	.	.	1	1	.	.	.	.	.	.	.	.
Pisum sativum subsp. *elatius*	.	.	.	.	.	.	.	.	.	.	+	+	.	.	.	.	.	.
Euphorbia characias	.	.	.	.	.	.	.	.	.	.	.	.	+	1	.	.	.	.
Loncomelos narbonense	.	.	.	.	.	.	.	.	.	.	.	.	.	+	+	.	.	.
Schenodorus arundinaceus	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.
Phalaris nodosa	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.
Haynaldia villosa	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.
Helminthotheca echioides	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.

Place and date of relevés
Rel.1-3: Pendio di sfatticci filladici lungo l'alveo del torrente Capitanello (Fiumedinisi), 16.V.1996
Rel.4: Pendio di sfatticci filladici lungo l'alveo del torrente Capitanello (Fiumedinisi), 16.V.1996
Rel.5: Pendio di sfatticci filladici sopra Rocchenere (Messina), 8.VI.1996
Rel.6: Pendio di sfatticci filladici presso Pagliara (Messina), 8.VI.1996
Rel.7: Pendio di sfatticci di arenarie presso Gaggi (Messina), 13.VI.1996
Rel.8-9: Pendio di sfatticci di arenarie sopra Graniti (Messina), 13.VI.1996
Rel.10: Presso il torrente Cardà (Messina), 13.VI.1996
Rel.11: Lungo la Fiumara Dinarini, presso Mandanici (Messina), 13.VI.1996
Rel.12: Biviere di S. Ninfa (Trapani), 2.IV.2005
Rel.13-15: Lungo la strada per Polizzi Generosa (Palermo), 8.VII.2009
Rel.16-18: Lungo la SS 417, presso Caltagirone (Catania), 27.XI.2009

Table 16 - Synoptic table of the *Bromo-Oryzopsion miliaceae* in Sicily

Association	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
Number of relevés	14	5	5	14	10	6	9	2	5	5	5	6	6	7	5	9	5	8	6
Char. Association																			
Centranthus ruber	V	V	V	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Euphorbia ceratocarpa	V	V	V	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Jacobaea lycopifolia	II	IV	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Thapsia garganica	.	.	.	IV	IV	.	.	.	.	.	.	.	.	.	.	.	.	III	.
Opoponax chironium	.	.	I	III	III	.	.	.	.	.	II	.	.	.	.	.	.	.	.
Diplotaxis tenuifolia	.	.	.	.	.	V	V	2	.	.	.	.	.	.	.	.	.	.	.
Sinapis pubescens	.	.	.	.	.	.	.	.	V	V	V	.	.	.	.	.	.	.	.
Tricholaena teneriffae	.	.	.	.	.	.	.	.	.	.	.	V	.	.	.	.	.	.	.
Euphorbia cupanii	.	.	.	.	.	.	.	.	.	.	.	.	V	.	.	.	.	.	.
Boerhavia repens subsp. *viscosa*	.	.	.	.	.	.	.	.	.	.	.	.	.	V	.	.	.	.	.
Ferulago campestris	.	.	.	.	.	.	.	.	.	.	.	.	.	.	V	.	.	.	.
Daucus siculus	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	V	.	.	.
Mantisalca salmantica	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	IV	.	.	.
Lathyrus sphaericus	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	V	.	.
Vicia benghalensis	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	V	.	.
Centaurea sonchifolia	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	V	.
Daucus carota subsp. *maximus*	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	V
Char. Alliance (*BROMO-ORYZOPSION MILIACEAE*)																			
Piptatherum miliaceum subsp. *miliaceum*	V	V	V	V	V	V	V	2	V	V	V	V	V	V	.	V	V	V	V
Dittrichia viscosa	V	V	V	V	V	V	V	1	V	V	V	V	V	V	V	I	.	V	V
Lepidium graminifolium	II	III	II	.	III	I	II	.	.	.	.	.	.	.	.	.	.	.	.
Plumbago europaea	.	III	.	.	V	.	II	1	.	.	.	.	II	.	.	.	.	.	.
Char. Order (*HYPARRHENIETALIA HIRTAE*)																			
Convolvulus althaeoides	V	IV	I	V	III	V	V	1	V	IV	.	V	V	III	II	V	.	.	I
Foeniculum piperitum	V	V	V	V	V	V	V	.	V	V	V	V	V	IV	IV	V	.	.	V
Hyparrhenia hirta	V	V	V	V	V	V	V	2	V	V	V	V	V	III	.	.	IV	V	.
Phagnalon saxatile	III	III	I	III	IV	V	II	.	III	IV	II	III	III	.	.	III	V	.	.
Micromeria graeca	III	IV	II	IV	III	V	IV	.	V	V	.	IV	.	.	IV	.	.	.	.
Andropogon distachyos	III	I	III	III	IV	.	.	.	IV	IV	.	IV	.	.	.	.	.	.	.
Lathyrus articulatus	.	.	I	IV	.	IV	.	.	IV	.	I	II	.	.	.	.	V	.	.
Ferula communis	.	.	II	V	V	.	.	.	.	.	V	.	.	.	.	.	.	.	I
Carlina gummifera	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	I
Lathyrus sylvestris	.	.	.	.	.	.	.	.	.	.	.	.	.	.	II	.	.	.	.
Char. Class (*LYGEO-STIPETEA*)																			
Lobularia maritima	IV	V	I	IV	IV	V	IV	2	V	III	IV	V	IV	III	.	IV	V	III	IV
Reichardia picroides	V	V	V	V	V	V	V	2	V	V	V	V	V	III	.	III	.	V	II
Verbascum sinuatum	IV	V	I	V	IV	IV	IV	2	IV	IV	.	II	V	V	.	II	.	.	III
Pallenis spinosa	IV	III	I	V	II	IV	IV	.	III	I	III	IV	IV	III	.	II	.	.	.
Calamintha nepeta	IV	V	III	IV	V	V	V	2	III	V	V	V	IV	IV	V	.	.	.	.
Dactylis hispanica	IV	IV	V	III	I	III	III	.	III	II	.	V	.	.	IV	.	.	V	IV
Bituminaria bituminosa	IV	III	V	III	II	IV	IV	1	IV	III	II	IV	.	II	.	.	.	.	III
Scabiosa maritima	IV	V	III	V	IV	V	IV	.	IV	V	III	V	IV	IV	III	.	.	.	.
Asphodelus ramosus	V	II	II	V	IV	V	IV	.	.	.	II	III	III	.	.	II	.	.	.
Charybdis maritima	V	III	.	V	III	IV	III	.	.	.	.	.	.	.	.	I	V	.	.
Carlina hispanica subsp. *globosa*	III	II	III	.	.	.	.	.	III	III	III	IV	.	.	III	.	.	.	.
Anthyllis vulneraria subsp. *maura*	.	.	.	.	.	IV	II	.	V	I	.	.	.	.	II	.	.	.	.
Convolvulus cantabrica	.	.	.	II	II	III	.	.	.	.	.	.	.	III	.	.	.	.	.
Centaurea nicaeensis	IV	III	.	III	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Allium arvense	.	III	.	.	.	.	.	.	.	.	.	.	III	.	III	.	.	.	.
Hypericum perforatum	.	.	I	.	.	.	.	.	.	.	.	.	.	.	IV	.	.	.	.
Arundo collina	.	.	V	.	.	.	.	.	.	.	II	.	.	.	.	.	.	.	.
Gypsophila arrostii	.	.	IV	.	.	.	.	.	.	.	I	.	.	.	.	.	.	.	.
Ampelodesmos mauritanicus	.	.	.	.	.	.	.	.	.	.	.	.	.	.	III	.	.	.	.
Elaeoselinum meoides	.	.	.	.	.	.	.	.	.	.	.	.	.	.	IV	.	.	.	.
Sanguisorba minor subsp. *minor*	III	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Asphodeline lutea	.	.	.	.	.	.	.	.	.	.	I	.	.	.	.	.	.	.	.
Hypericum perfoliatum	.	.	.	.	.	.	.	.	.	.	I	.	.	.	.	.	.	.	.
Scabiosa atropurpurea	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	II

1 - *Centrantho rubri-Euphorbietum ceratocarpae* (after Brullo 1984, tab.1 ril.1-14)
2 - *Centrantho rubri-Euphorbietum ceratocarpae* (after Brullo 1984, tab.1 ril.15-19)
3 - *Centrantho rubri-Euphorbietum ceratocarpae* (tab.17A)
4 - *Thapsio garganicae-Feruletum communis* (after Brullo 1984, tab.2 ril.1-14)
5 - *Thapsio garganicae-Feruletum communis* (after Brullo 1984, tab.2 ril.15-24)
6 - *Diplotaxio tenuifoliae-Oryzopsietum miliaceae* (after Brullo 1984, tab.3, ril.1-6)
7 - *Diplotaxio tenuifoliae-Oryzopsietum miliaceae* (after Brullo 1984, tab.3 ril.7-15)
8 - *Diplotaxio tenuifoliae-Oryzopsietum miliaceae* (tab.17B)
9 - *Sinapio pubescentis-Oryzopsietum miliaceae* (after Brullo 1984, tab.4 ril.1-5)
10 - *Sinapio pubescentis-Oryzopsietum miliaceae* (after Brullo 1984, tab.4 ril.6-10)
11 - *Sinapio pubescentis-Oryzopsietum miliaceae* (tab.17C)
12 - *Tricholaeno teneriffae-Oryzopsietum miliaceae* (after Brullo 1984, tab.5)
13 - *Euphorbietum cupanii* (after Brullo 1984, tab.6)
14 - *Boerhaavio viscosae-Oryzopsietum miliaceae* (after Brullo 1984, tab.7)
15 - *Dittrichio viscosae-Ferulaginetum campestris* (after Brullo 1984, tab.9)
16 - *Mantisalco salmanticae-Oryzopsietum miliaceae* (after Bartolo et al. 1990, tab.15)
17 - *Lathyro sphaerci-Oryzopsietum miliaceae* (after Brullo & Siracusa 1996, tab.6)
18 - *Centaureetum sonchifoliae* (tab.18A)
19 - *Dauco maximi-Oryzopsietum miliaceae* (tab.18B)

Table 18
A) *Centauretum sonchifoliae*
B) *Dauco maximi-Oryzopsietum miliaceae*

Relevé	1*	2	3	4	5	6	7	8	9	10	11	12	13	14
Altitude (mt a.s.l.)	10	10	10	15	15	10	15	10	265	90	1	100	90	20
Plot size (sq.m.)	20	20	15	20	25	15	20	20	50	50	50	10	20	10
Cover (%)	100	100	100	100	100	100	100	100	80	100	90	80	90	90
Association	A	A	A	A	A	A	A	A	B	B	B	B	B	B
Char. Association														
Centaurea sonchifolia	3	2	2	3	3	2	3	2	.	.	.	.	.	.
Daucus carota subsp. *maximus*	.	.	.	.	.	.	.	.	1	1	1	2	2	1
Char. Alliance (*BROMO-ORYZOPSION MILIACEAE*)														
Piptatherum miliaceum subsp. *miliaceum*	2	1	+	2	1	+	1	1	3	4	4	4	5	5
Dittrichia viscosa	+	1	1	+	1	+	1	+	1	.	1	2	1	1
Char. Order (*HYPARRHENIETALIA HIRTAE*)														
Hyparrhenia hirta	1	+	+	1	+	.	1	+	.	.	.	.	.	.
Thapsia garganica	1	+	.	.	1	.	.	1	.	.	.	.	.	.
Convolvulus althaeoides	.	.	.	.	.	.	.	.	.	+	.	.	.	.
Ferula communis	.	.	.	.	.	.	.	.	.	1	.	.	.	.
Carlina gummifera	.	.	.	.	.	.	.	.	1	.	.	.	.	.
Char. Class (*LYGEO-STIPETEA*)														
Dactylis hispanica	+	+	1	+	1	1	+	1	+	.	.	+	+	+
Reichardia picroides	1	1	2	1	1	1	+	+	.	+	+	.	.	.
Lobularia maritima	+	.	+	.	+	.	+	.	+	.	.	1	1	+
Foeniculum piperitum	.	.	.	.	.	.	.	.	1	+	.	+	1	1
Bituminaria bituminosa	.	.	.	.	.	.	.	.	.	.	2	+	.	1
Verbascum sinuatum	.	.	.	.	.	.	.	.	.	.	1	1	.	1
Carlina sicula	.	.	.	.	.	.	.	.	1	.	.	.	.	.
Centaurea nicaeensis	.	.	.	.	.	.	.	.	+	.	.	.	.	.
Other species														
Cynodon dactylon	1	2	2	1	2	+	1	1	.	1	.	.	1	2
Daucus carota	+	1	1	+	+	+	+	+	.	.	.	.	.	.
Reseda alba	1	2	1	1	1	+	.	+	.	.	+	.	.	.
Asparagus acutifolius	1	+	1	1	1	1	+	1	.	.	.	.	.	.
Lolium rigidum	2	2	1	2	2	1	2	1	.	.	.	.	.	.
Bromus diandrus	+	1	+	+	+	+	1	+	.	.	.	.	.	.
Smilax aspera	1	1	1	1	1	1	+	+	.	.	.	.	.	.
Isatis canescens	+	+	1	+	1	+	1	+	.	.	.	.	.	.
Rubus ulmifolius	+	.	+	1	1	.	+	1	+	.	.	.	.	.
Halimione portulacoides	1	1	+	.	.	1	1	+	.	.	.	.	.	.
Trifolium scabrum	+	.	+	+	.	.	+	+	.	.	.	.	.	.
Ficus carica	2	1	.	1	1	1	.	.	.	.	.	.	.	.
Nicotiana glauca	.	.	.	.	1	+	1	+	.	.	.	.	.	.
Euphorbia dendroides	.	1	.	.	1	.	1	1	.	.	.	.	.	.
Avena barbata	.	.	.	.	.	.	.	.	1	.	.	1	+	.
Arundo donax	.	.	1	2	.	1	.	.	.	.	.	.	.	.
Conyzanthus squamatus	.	.	.	.	.	.	.	.	.	1	+	.	.	1
Scolymus grandiflorus	.	.	.	.	.	.	.	.	+	1	.	.	.	.
Sonchus oleraceus	.	.	.	.	.	.	.	.	.	.	1	.	+	.
Lotus cytisoides	.	.	.	.	.	.	.	.	1	.	+	.	.	.
Atriplex halimus	2	.	+	.	.	.	.	.	.	.	.	.	.	.
Scabiosa maritima	.	.	.	.	.	.	.	.	1	.	+	.	.	.
Beta maritima	.	.	.	.	.	.	.	.	+	1	.	.	.	.
Chrysanthemum coronarium	.	.	.	.	.	.	.	.	1	.	+	.	.	.
Rumex pulcher subsp. *woodsii*	.	.	.	.	.	.	.	.	+	.	+	.	.	.
Convolvulus arvensis	.	.	.	.	.	.	.	.	.	.	+	.	+	.
Solanum nigrum	.	.	.	.	.	.	.	.	.	.	+	.	.	1
Verbena officinalis	.	.	.	.	.	.	.	.	.	1	.	.	.	.
Echium plantagineum	.	.	.	.	.	.	.	.	.	.	1	.	.	.
Dasypyrum villosum	.	.	.	.	.	.	.	.	1	.	.	.	.	.
Scorzonera hirsuta	.	.	.	.	.	.	.	.	+	.	.	.	.	.
Helminthotheca echioides	.	.	.	.	.	.	.	.	.	1	.	.	.	.
Trifolium fragiferum	.	.	.	.	.	.	.	.	.	+	.	.	.	.
Glaucium flavum	.	.	.	.	.	.	.	.	.	.	+	.	.	.
Ecballium elaterium	.	.	.	.	.	.	.	.	.	.	+	.	.	.

Place and date of relevés
Rel.1-8: Scogliera di Acicastello (Catania), 28.VII.1995
Rel.9: C.da Verdelicia, Buturro (Trapani), 25.VII.2006
Rel.10: Feudo Bucari, Borgata costiera (Trapani), 25.VII.2006
Rel.11: Area portuale di Trapani, 28.VII.2006
Rel.12-13: Nesima (Catania), 7.VII.1988
Rel.14: Area portuale di Catania, 7.VII.1988