Analiza vegetacije na otoku Čiovu (Hrvatska)

The Vegetation Analysis of the Island Čiovo (Croatia)

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Sažetak: Fitocenološka analiza biljnog pokrova otoka Čiova kod Trogira u Republici Hrvatskoj pokazala je da se na opožarenim i pašnjačkim površinama razvijaju kamenjarsko-pašnjačke zajednice – na južnim padinama otoka as. *Brachypodio-Cymbopogonetum hirti*, a na grebenu i sjevernoj padini as. *Koelerio-Festucetum illyricae* subas. *brachypodietum retusi*.
Slijed sukcesije as. *Brachypodio-Cymbopogonetum hirti*, započinje razvojem stadija *Juniperus phoenicea*, stadija *Cistus monspeliensis* i stadija *Cistus creticus*, koji vrlo brzo prelaze u makiju as. *Pistacio-Juniperetum phoeniceae* i as. *Oleo-Juniperetum phoeniceae*. Na južnoj padini i vršnom dijelu grebena sukcesija vrlo brzo teče dalje u smjeru šume alepskog bora as. *Junipero phoeniceae-Pinetum halepensis* koja se dalje održava kao trajni stadij.
Na sjevernoj padini i zapadnom dijelu otoka sukcesija teče u smjeru šuma alepskog bora as. *Pistacio-Pinetum halepensis* i as. *Querco ilicis-Pinetum halepensis*.
Sukcesija završava razvitkom klimazonalne šumske vegetacije as. *Myrto-Quercetum ilicis* na toplijim položajima.
Ključne riječi: suksesija vegetacije, otok Čiovo, Hrvatska

Abstract: Phytocoenological analysis plant cover of island Čiovo near Trogir, Croatia, shows that rocky-pasture associations have developed on the fire and pasture sites – on the southern slope of the island as. *Brachypodio-Cymbopogonetum hirti* and on the crest and northern slope as. *Koelerio-Festucetum illyricae* subas. *brachypodietum retusi*.
The succession of as. *Brachypodio-Cymbopogonetum hirti* starts with the development of stage *Juniperus phoenicea*, then stage *Cistus monspeliensis* and stage *Cistus creticus*, which very quickly transformes into macchia of as. *Pistacio-Juniperetum phoeniceae* and as. *Oleo-Juniperetum phoeniceae*. On the southern slope and crest peak the succession expands very quickly towards Aleppo pine forest of as. *Junipero phoeniceae-Pinetum halepensis* which stays as a constant stage.
On the northern slope and on the western part of the island succession runs towards Aleppo pine forest of as. *Pistacio-Pinetum halepensis* and as. *Querco ilicis-Pinetum halepensis*.
The succession finishes with the development of climazonal forest vegetation as. *Myrto-Quercetum ilicis* on warmer sites.
Keywords: succession vegetation, island Čiovo, Croatia

1. Introduction

Čiovo is an island situated in the middle part of the Adriatic coast, in Croatia. It is situated west of Split, and from the southwestern side closes the Kaštela Bay. Its northwestern part is connected with the town Trogir by leaf bridge. In length it is 14.3 km and covers aproximately 29 km². Čiovo's highest peck is 218 m above sea-level. The geological bed consists of limestone which develops limestone soil. Climavegetationaly the island belongs to the stenomediterranean and eumediterranean vegetational zone.

In historical-eccomonical terms the few islanders raised cattle and wines, the woods were chopped down for firewood, pastures and only a small part for farming. As cattle raising is completly and farming mostly neglected, abandoned areas are overgrown with elements of forestic vegetation. These elements after occasional fires gave up over rocky-pasture vegetation.

Up to this point the floristic and vegetational studies of island Čiovo (Slade Šilović, 1909; Trinajstić & Kamenjarin, 1998, Kovačić & al., 2001, Trinajstić & Kamenjarin, 2001) have been fragmentary. Therefor an analysis of the natural vegetation has been conducted in order to research the succession of its vegetation.

2. Materials and methods

The vegetation researches carried out on the island Čiovo in the spring, summer and autumn of 2002 are based on the combined estimation according to the Zürich-Montpellier school, while the syntaxonomic nomenclature is presented according to Horvatić (1963) and Trinajstić (1973, 1977, 1987, 1988, 1995).

3. Results

On the basis of phytosociological research, the studied vegetation of island Čiovo could be shown in terms of syntaxonomy in the following way:

Class: *Festuco-Brometea* Br.-Bl. et Tüxen 1943
Order: *Scorzonero-Chrysopogonetalia* Ht. et H-ić. 1934
Alliance: *Chrysopogoni-Saturejon* H-ić. et Ht. (1956)1958
Ass: *Koelerio-Festucetum illyricae* (H-ić. 1962) Trinajstić 1992 subass. *brachypodietosum retusi* Trinajstić 1992
Class: *Thero-Brachypodietea* Br.-Bl. 1947
Order: *Cymbopogo-Brachypodietalia* H-ić. (1956)1958
Alliance: *Cymbopogo-Brachypodion retusi* (»*ramosi*«) H-ić. (1956) 1958
Ass: *Brachypodio-Cymbopogonetum hirti* H-ić. 1961
Class: *Erico-Cistetea* Trinajstić (1978) 1985
Order: *Cisto-Ericetalia* H-ić. 1958
Alliance: *Cisto-Ericion* H-ić. 1958
Stadium: *Cistus monspeliensis*
Stadium: *Cistus creticus*
Class: *Querceta ilicis* Br.-Bl. 1947
Order: *Quercetalia ilicis* Br.-Bl. (1931) 1936
Alliance: *Quercion ilicis* Br.-Bl. (1931)1936
Ass: *Pistacio-Pinetum halepensis* De Marco, Veri et Caneva 1984
Ass: *Querco ilicis-Pinetum halepensis* Loisel 1971
Ass: *Myrto-Quercetum ilicis* (H-ić.) Trinajstić 1985
Alliance: *Oleo-Ceratonion* Br.-Bl. 1931
Stadium: *Juniperus phoenicea*
Ass: *Pistacio-Junipertum phoeniceae* Trinajstić 1987
Ass: *Oleo-Junipertum phoeniceae* Bruno et al. 1983
Ass: *Junipero phoeniceae-Pinetum halepensis* Trinajstić 1989

On the southern, warmer side of the island relatively large areas of the rocky-pasture association *Brachypodio-Cymbopogonetum hirti* are spread, as a result of antropogenetic degradation. Floristic composition is shown on table 1 which was made on the basis of 5 phytosociological records. 49 species have been recorded and *Heteropogon contortus*, *Brachypodium retusum* and *Hyparrhenia hirta* dominate.

In this case, companions show that association *Brachypodio-Cymbopogonetum hirti* relatively quickly turns into stage *Cistus monspeliensis* on the southwestern part of the south slope and western part of the island. The floristic composition shown on table 2 is a result of 4 phytosociological records. 26 species have been recorded. As there is no flysh beding associations *Erica manipuliflora* and *Erica arborea* are absent and association *Rosmarinus officinalis* is missing because of the cold.

Also the association *Brachypodio-Cymbopogonetum hirti* relatively quickly turns into stage *Juniperus phoenicea* on the southeastern part of the south slope. The floristic composi-

tion is shown on table 3 which is a result of 3 phytosociological records. 22 species have been recorded.

The apperance of elements of class *Thero-Brachypodietea* among the companions shows the origin of this association and of class *Quercetea ilicis* which means that stages *Juniperus phoenicea* and *Cistus monspeliensis* are overgrown with elements of macchia and on the south side of Čiovo, near the sea, in deeper grounds protected from the northern winds association *Pistacio-Juniperetum phoeniceae* is developed which floristic composition is shown on table 4. The table is a result of 7 phytosociological records. Dominating are *Juniperus phoenicea, Pistacia lentiscus* and *Juniperus macrocarpa*. All together 40 species have been recorded and among the companions a lot of elements of class *Cisto-Ericetea* and class *Thero-Brachypodietea* are found.

On the crest, on somewhat shallow ground, exposed to the northern and southern wind association *Oleo-Juniperetum phoeniceae is* developed whose floristic composition is shown on table 5. It is made from 8 phytosociological records. Dominating are *Juniperus phoenicea, J. macrocarpa, Olea europaea* and *O. sylvestris*. 24 species have been recorded. Among the companions elements of class *Thero-Brachypodietea* and class *Erico-Cistetea* stand out and indicate the origin of this association.

Further succession of associations *Pistacio-Juniperetum phoeniceae and Oleo-Juniperetum phoenicae* goes towards evolution of forests – *association Junipero phoeniceae-Pinetum halepensis* which lean on the prior associations. The floristic composition is shown on table 6 which was made according to 9 phytosociological records. 36 species have been recorded. This association stayes for a long time as a permanently stage. And here we can find elements of classes *Thero-Brachypodietea* and *Erico-Cistetea* among the companions but in a smaller amount.

On the crest and northern slopes of the island the rocky-pasture association *Koelerio-Festucetum illyricae* subassociation *brachypodietosum retusi* develops as a result of colder, north winds and antropogenetic influence .

The elements of class *Festuco-Brometea* belong to submediterranean, while Čiovo completetly belongs to eumediterranean. This can be explained that while cattle breeding was high on the island, the cattle was brought from the submediterranean to Čiovo, with it the seeds of class *Festuco-Brometea*. Floristic composition is shown on table 7 which was made on the basis of 11 phytosociological records. Classified are 75 species. Dominate *Brachypodium retusum, Bupleurum veronense* and *Festuca dalmatica*.

Among the companions elements of class *Erico-Cistetea* and class *Quercetea ilicis* show up which indicates that the succesion of rocky pastures association *Koelerio-Festucetum illyricae* subassociation *brachypodietosum retusi* develops into stage Cistus creticus. Because of the kind of ground we miss species of genus *Erica*. The floristic composition is shown on table 8 which was made on the basis of 7 phytosociological records. 34 species have been recorded.

Among the companions grassland elements of both classes appear and elements of class *Quercetea ilicis* indicate that stage *Cistus creticus* turns into a forest of association *Pistacio-Pinetum halepensis* which is developed on the northern slope and on part of the crest. In case that the acorn of holm oak isn't supplied it stayes for a long time as a permanent stage. The floristic composition is shown on table 9 which was made on the basis of 6 phytosociological records. 40 species have been recorded. *Pistacia lentiscus* dominates in the shrubbery. Among the companions elements of grassland vegetation appear and elements of class *Erico-Cistetea*.

If the source of holm-oak acorn is secured association *Pistacio-Pinetum halepensis* quickly transforms into association *Querco ilicis-Pinetum halepensis*. The floristic composition is shown in table 10 which was made on the basis of 4 phytosociological records. 40 species have been recorded. *Quercus ilex* and *Pistacia terebinthus* dominate in the shrubbery layer. Among the companions elements of grassland vegetation appear and so do elements of class *Erica-Cistetea*.

Further succession of association *Querco ilicis-Pinetum halepensis* proceeds in the direc-

tion of evolution of climazonal evergreen forest vegetation – association *Myrto-Quercetum ilicis* as shown on table 11 made from 6 phytosociological records. In the layer of forest dominate *Quercus ilex*, and in the shrubbery layer *Quercus ilex, Myrtus communis* and *Pistacia lentiscus*. All together 45 species have been recorded. This association is completely developed on the north side of the island, near Sveti Križ and on the western side near Okruk Donji. Among the companions still appear elements of grassland vegetation and elements of class *Erica- Cistetea*.

4. Discussion and conclusion

Succession of rocky-pasture meadows vegetation depends on the humidity, as it is shown na picture 2. In semihumid areas of the island Čiovo, like its southern and western slopes, grassland association *Brachypodio-Cymbopogonetum hirti* developes, which overgrows fast with elements of garigue and so stages *Juniperus phoenicea* and *Cistus monspeliensis* appear. They cross into macchia associations *Pistacio-Juniperetum phoeniceae* and *Oleo-Juniperetum phoeniceae*. Further more, with their succession association *Junipero phoeniceae-Pinetum halepensis* developes and because of the aridic conditions stayes long as a permanent stage.

In humid part of Čiovo, such as the crest and north slope, the rocky-pasture grassland is developed – association *Koelerio-Festucetum illyricae* subassociation *brachypodietosum retusi* – which overgrows with elements of garigue which results into stage *Cistus creticus*. This stage can turn into association *Oleo-Junipertum phoeniceae* and association *Pistacio- Juniperetum phoeniceae* but mostly it forms association *Pistacio-Pinetum halepensis*. If the source of holm-oak acorn isn't provided it stays as a permanent stage. If the holm-oak acorn is provided it will quickly transform into associastion *Querco ilicis-Pinetum halepensis*. The succession finishes its forming with climazonal forestic vegetation – association *Myrto-Quercetum ilicis*.

The frequency of characteristic sorts of vegetational classes in all of the studied associations is shown in table 12

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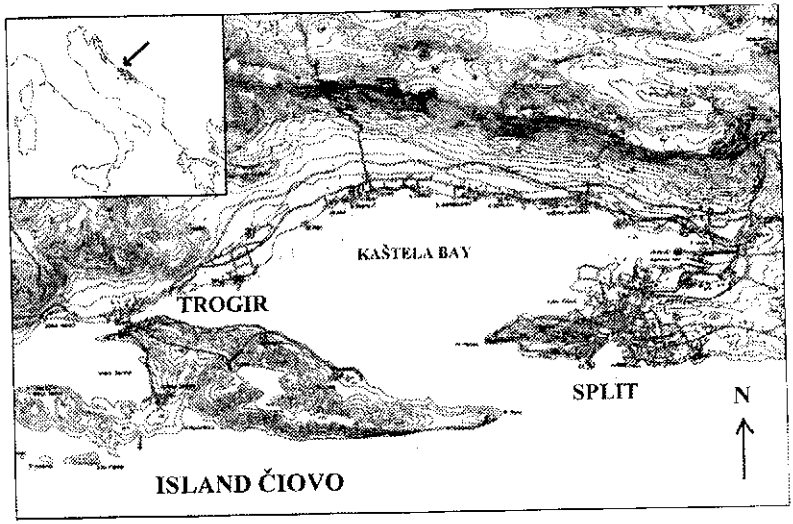


Picture 1. Geographical position of studied area

No. of veget. record	1	2	3	4	5	?(%)
Size of veget. record (m^2)	100	50	100	50	100	/
No. of species	15	16	22	26	20	/
Char. ass.:						
Heteropogon contortus	3.3	3.3	2.2	2.2	2.2	100
Char. all., order and class:						
Brachypodium retusum	1.2	2.3	3.3	4.4	4.3	100
Hyparrhenia hirta	3.3	1.2	3.2	1.2	1.2	100
Convolvulus cantabricus	+.2	+	1.1	+	1.1	100
Galium corrudaefolium	+	+	1.2	+	+.2	100
Fumana ericoides	+	+.3	+.3	+.2	.	80
Teucrium polium	.	+.2	+.2	+.2	.	60
Allium subhirsutum	.	+.3	.	+.3	.	40
Convolvulus elegantissimus	.	.	1.2	.	.	20
Tanacetum cinerariifolium	.	.	.	.	1.2	20
Lagurus ovatus	.	.	.	.	1.1	20
Lotus edulis	.	.	.	.	1.1	20
Cynosurus echinatus	.	.	+	.	.	20
Linum spicatum	.	.	+	.	.	20
Diff. all. , order and class:						
Petrorhagia saxifraga	+	1.1	1.2	+	+.2	100
Seseli tomentosum	+	+	1.1	+	1.1	100
Salvia officinalis	+.2	.	.	+.2	2.2	60
Euphorbia spinosa	+.2	.	+.2	+.2	.	60
Satureja montana	.	+.2	.	.	2.2	40
Euphorbia fragifera	.	+.2	.	.	1.2	40

Dactylis hispanica	.	+.2	.	+.2	.	40
Chrysopogon gryllus	.	.	2.2	.	.	20
Ruta divaricata	.	.	1.2	.	.	20
Leontodon autumnalis	.	.	1.2	.	.	20
Linum galicum	.	.	+.2	.	.	20
Bellis sylvestris	.	.	.	+.2	.	20
Anthyllis rubicunda	.	.	.	+	.	20
Astragalus muelleri	.	.	.	+	.	20
Bupleurum veronense	.	.	+	.	.	20
Dianthus tergestinus	.	.	+	.	.	20
Melica ciliata	+	.	.	.	.	20
Comp.						
Asparagus acutifolius	.	.	1.2	+	2.2	60
Cistus incanus	.	.	.	+	3.3	40
Juniperus macrocarpa	.	.	.	3.3	3.4	40
Sedum rupestre	.	1.3	.	+	.	40
Teucrium flavum	.	.	.	+.2	+.3	40
Ephedra fragilis	.	.	+.2	.	+.2	40
Aethionema saxatile	.	+	.	+	.	40
Prasium majus	.	+	.	+	.	40
Coronilla emeroides	.	.	.	.	2.2	20
Pistacia lentiscus	.	.	.	1.2	.	20
Coronilla valentina	.	.	.	+.2	.	20
Smilax aspera	.	.	.	.	+.2	20
Avena barbata	.	.	.	+	.	20
Lotus corniculatus	+	.	.	.	.	20
Mercurialis annua	+	.	.	.	.	20
Muscari comosum	+	.	.	.	.	20
Silene angustifolia	.	.	+	.	.	20
Vicia gracilis	+	.	.	.	.	20

Tab. 1. Ass. Brachypodio-Cymbopogonetum hirti H-ić. 1961

No. of veget. record	1	2	3	4	?(%)
Size of veget. record (m^2)	50	50	50	50	/
No. of species	10	19	13	8	/
Char. all., order and class:					
Cistus monspeliensis	3.3	3.3	2.3	4.3	100
Cistus creticus	2.3	2.3	+.2	.	75
Fumana ericoides	.	+.2	.	+.2	75
Comp:					
Brachypodium retusum	2.2	2.3	1.3	1.3	100
Pistacia lentiscus	+.3	1.3	+.3	+.3	100
Satureja montana	+.2	+.2	+.2	+.2	100
Asparagus acutifolius	+.2	+.2	+.2	.	75
Salvia officinalis	+.2	+.2	+.2	.	75
Spartium junceum	1.3	+.3	.	.	50
Euphorbia spinosa	+.3	+.3	.	.	50
Euphorbia wulfenii	+.3	.	+.2	.	50
Pistacia terebinthus	.	.	+	+.2	50
Convolvulus cantabricus	.	+	+	.	50
Micromeria juliana	.	.	+.2	.	25
Festuca dalmatica	.	+.2	.	.	25
Teucrium pollium	.	+.2	.	.	25
Allium flavum	.	+	.	.	25
Asphodelus microcarpus	.	+	.	.	25
Carduus micropterus	.	.	.	+	25
Chaerophyllum coloratum	.	.	.	+	25
Daucus major	.	+	.	.	25
Dianthus tergestinus	.	+	.	.	25
Echium italicum	.	+	.	.	25
Eryngium amethystinum	.	+	.	.	25
Petrorarghia saxifraga	.	.	+	.	25
Silene angustifolia	.	.	+	.	25

Tab. 2. Stadium *Cistus monspeliensis*

No. of veget. record	1	2	3	?(%)
Size of veget. record (m^2)	50	50	50	/
No. of species	15	13	17	/
Char. all., order and class:				
Juniperus phoenicea	3.3	3.3	3.4	100
Juniperus macrocarpa	2.2	1.2	1.2	100
Asparagus acutifolius	+.2	+.2	+.2	100
Lonicera implexa	.	+.2	+.2	67
Olea sylvestris	.	.	+.2	33
Comp.:				
Brachypodium retusum	3.3	2.2	3.2	100
Coronilla emeroides	+.3	+.2	+.2	100
Heteropogon contortus	+.3	+.2	+.2	100
Briza maxima	+.2	+.2	+.2	100
Teucrium pollium	+.2	+.2	+.2	100
Bellis sylvestris	+	+	+	100
Bupleurum veronense	.	+.2	+.2	67
Hyparrhenia hirta	+.2	.	+.2	67
Micromeria juliana	+.2	.	+.2	67
Salvia officinalis	+.2	.	+.2	67
Carduus mycropterus	.	.	+.2	33
Cistus monspeliensis	.	+.2	.	33
Coronilla valentina	.	.	+.2	33
Dactylis hispanica	.	+.2	.	33
Galium corrudaefolium	+.2	.	.	33
Seseli tomentosum	+.2	.	.	33
Dianthus tergestinus	+	.	.	33

Tab. 3. Stadium *Juniperus phoenicea*

No. of veget. record	1	2	3	4	5	6	7	?(%)
Size of veget. record (m^2)	100	100	100	100	100	100	100	/
No. of species	19	21	22	14	13	14	18	/
Char. ass.:								
B *Juniperus phoenicea*	+.2	+.2	+.2	1.2	2.2	3.2	3.2	100
Char. all.:								
B *Pistacia lentiscus*	2.3	2.3	2.2	2.3	2.3	2.2	2.3	100
Juniperus macrocarpa	1.3	2.2	2.2	2.2	1.2	.	+.2	86
Olea europaea	2.3	1.2	1.2	1.2	1.2	.	.	71
Ceratonia siliqua	.	+.2	1.2	1.2	.	.	+.2	57
Prasium majus	1.2	.	+2	.	.	+.2	+.2	57
Ephedra fragilis	1.2	.	.	.	.	1.2	+.2	43
Olea sylvestris	.	+.2	.	.	.	.	+.2	29
Coronilla valentina	.	.	1.3	.	.	.	.	14
Char. order and class:								
B *Quercus ilex*	.	.	.	.	.	2.2	1.2	29
Spartium junceum	.	+.2	.	.	2.2	.	.	29
Lonicera implexa	.	.	+	.	.	.	+	29
C *Asparagus acutifolius*	+.2	+.2	+	+	+.2	+.2	+.2	100
Smilax aspera	.	+.2	1.2	1.2	+.2	1.2	.	71
Rubia peregrina	.	+	.	.	+	1.2	.	43
Allium subhirsutum	+	+	.	.	.	.	.	29
Comp.								
Brachypodium retusum	2.2	2.3	2.2	1.1	2.3	1.2	2.3	100
Cistus creticus	.	2.3	3.2	1.2	3.3	+.2	.	71
Salvia officinalis	.	.	+	+	+.2	+.2	+	71
Coronilla emeroides	+.2	2.2	.	.	.	+.2	+.2	57
Teucrium chamaedrys	1.2	.	.	.	.	+.2	+.2	43
Cistus monspeliensis	.	+.2	+.2	.	+.2	.	.	43
Mercurianis annua	+	.	.	+	.	.	+.2	43
Anagalis coerulea	+	+	+	.	.	.	.	43
Geranium columbinum	+	.	+	+	.	.	.	43
Muscari comosum	.	.	+	+	.	.	+	43
Teucrium polium	+	.	.	.	.	+	+	43
Vicia hibrida	+	.	+	.	+	.	.	43
Euphorbia wulfenii	.	+	+.2	.	.	.	.	29
Crucianella latifolija	.	+	+	.	.	.	.	29
Dorycnium hirsutum	.	+	+	.	.	.	.	29
Euphorbia fragifera	+.2	.	.	.	.	.	.	14
Ficus carica	.	.	+.2	.	.	.	.	14
Satureja montana	+.2	.	.	.	.	.	.	14
Avena fatua	.	.	.	+	.	.	.	14
Daucus carota	.	.	.	.	.	.	+	14
Phagnalon rupestre	+	.	.	.	.	.	.	14
Scorsonera vilosa	+	.	.	.	.	.	.	14
Urospermum picroides	.	+	.	.	.	.	.	14
Vicia sativa subsp. angustifolia	.	+	.	.	.	.	.	14

Tab. 4. Ass. *Pistacio-Juniperetum phoeniceae* Trinajstić 1987

No. of veget. record	1	2	3	4	5	6	7	8	?(%)
Size of veget. record (m^2)	100	100	100	100	100	100	100	100	/
No. of species	7	11	13	10	9	10	15	12	/
Char. ass.:									
B *Olea sylvestris*	+.2	+.2	+.2	+.2	+.3	1.3	+.2	+.2	100
Diff. ass:									
B *Juniperus phoenicea*	3.3	2.3	3.3	2.3	3.3	2.3	2.2	3.3	100
Char. all:									
Juniperus macrocarpa	2.3	2.2	1.3	2.2	1.3	1.3	1.3	1.2	100
Olea europaea	1.3	+	1.2	+.2	1.3	+.2	1.3	1.3	100
Pistacia lentiscus	.	.	.	.	.	.	+.2	+.2	25
Arbutus unedo	.	.	.	.	.	.	+.3	.	13
Ephedra fragilis	.	.	.	.	+.3	.	.	.	13
Char. order and class:									
B *Phillyrea media*	.	.	+.3	+.3	1.3	1.3	1.2	1.3	75
Pistacia terebinthus	.	+.2	.	.	.	.	+.2	.	25
Quercus ilex	.	.	.	.	.	.	+.2	+.2	25
C *Asparagus acutifolius*	.	.	.	.	.	+.2	.	+.2	25
Ruscus aculeatus	.	.	.	.	.	.	.	+.2	13
Comp:									
B *Cistus creticus*	.	+	.	+.2	+.2	+.2	.	+.2	63
C *Brachypodium retusum*	3.3	2.3	2.3	1.2	2.3	2.2	2.3	+.3	100
Scilla autumnalis	+	+	+	.	+	+	+	+	88
Salvia officinalis	+.2	.	+.2	+.2	.	.	+.2	.	50
Euphorbia spinosa	.	+.3	+.2	+.2	.	.	+.2	.	38
Fumana ericoides	.	+.2	.	.	.	+.2	.	.	25
Teucrium polium	.	.	+.2	.	.	.	+	.	25
Bupleurum veronense	.	.	+	.	.	.	+	.	25
Hypericum veronense	.	.	+.2	.	.	.	.	.	13
Chamaecytisus spinescens	.	+.2	.	.	.	.	.	.	13
Carduus mycropterus	.	.	+	.	.	.	.	.	13
Geranium columbinum	.	.	.	+	.	.	.	.	13

Tab. 5. Ass. *Oleo-Juniperetum phoeniceae* Bruno et al. 1983

No. of veget. record	1	2	3	4	5	6	7	8	9	?(%)
Size of veget. record (m^2)	100	100	100	100	100	100	100	100	100	/
No. of species	21	14	11	13	10	10	13	6	12	/
Char. ass.:										
A *Pinus halepensis*	3.1	3.1	3.1	4.1	2.1	3.1	2.1	2.1	3.1	100
B *Pinus halepensis*	+	+	+	.	+	.	.	.	.	44
Diff. ass.:										
B *Juniperus phoenicea*	1.2	1.2	2.2	2.2	3.2	2.3	1.2	1.2	1.2	100
Char. all.:										
B *Juniperus macrocarpa*	+.2	+.2	3.2	2.2	2.2	2.3	1.2	1.2	1.2	100
Olea sylvestris	1.1	.	+.2	+.2	.	+.2	+.2	.	+	67
Olea europaea	.	.	+.3	+.2	.	+.2	+.2	.	.	44
Myrtus communis	.	+.3	.	.	.	.	.	.	.	11
Prasium majus	.	.	.	.	.	.	.	.	+.2	11
Char. order and class:										
B Pistacia lentiscus	+.3	.	+.3	.	+.2	1.3	.	.	1.2	56
Phillyrea media	+.2	.	+.2	.	.	+.2	+	.	+	56
Pistacia terebinthus	.	+.3	.	.	.	.	+.2	.	.	22
C *Asparagus acutifolius*	1.2	+.3	1.3	+.3	.	+.2	+.2	+.2	+.2	89
Rubia peregrina	+.2	+.2	.	.	.	.	+.2	.	+	44
Carex distachya	+.3	+.2	.	.	.	.	.	.	.	22
Smilax aspera	+.3	.	.	.	+.2	.	.	.	.	22
Allium subhirsutum	+	.	.	.	.	.	.	.	+	22
Comp.:										
B *Prunus mahaleb*	+.2	.	.	+	+	.	+.2	.	.	44
Coronilla emeroides	.	+.3	.	.	+	.	+.3	.	.	33
Cistus creticus	.	+.2	.	+.2	.	.	.	.	.	22
Cistus monspeliensis	+.3	.	.	.	.	.	.	.	.	11
Paliurus spina christi	.	.	.	+.2	.	.	.	.	.	11
Fraxinus ornus	.	+.2	.	.	.	.	.	.	.	11
Cistus salvifolius	.	.	.	.	.	.	+.2	.	.	11
C *Brachypodium retusum*	1.2	2.3	3.3	4.4	3.3	3.3	3.3	4.4	4.3	100
Salvia officinalis	+.2	.	.	+.2	+.2	.	.	+.2	.	44
Dactylis hispanica	+.2	+.2	+	+.2	.	.	.	.	.	44
Ceterach officinarum	+.2	.	.	.	.	+.2	.	.	.	22
Briza maxima	+.2	.	.	.	.	.	.	.	.	11
Euphorbia wulfenii	+.2	.	.	.	.	.	.	.	.	11
Hypericum veronense	.	.	.	.	+.2	.	.	.	.	11
Satureja montana	.	+.2	.	.	.	.	.	.	.	11
Teucrium polium	+.2	.	.	.	.	.	.	.	.	11
Geranium columbinum	.	.	.	+	.	.	.	.	.	11
Plantago lanceolata	+	.	.	.	.	.	.	.	.	11
Sanguisorba muricata	.	.	+	.	.	.	.	.	.	11
Sonchus sp.	.	.	.	.	.	.	.	.	+	11

Tab. 6. Ass. *Junipero phoeniceae-Pinetum halepensis* Trinajstić 1989

No. of veget. record	1	2	3	4	5	6	7	8	9	10	11	?(%)
Size of veget. record (m^2)	150	100	100	100	100	150	150	150	100	100	150	/
No. of species	27	20	24	29	28	31	29	18	19	23	26	/
Char. as.:												
Festuca illyrica	.	+.2	.	.	.	1.3	+.3	.	+2	+2	+.2	55
Diff. as.:												
Brachypodium retusum	3.3	2.3	3.2	2.2	2.3	3.3	2.3	2.2	2.3	2.3	3.3	100
Briza maxima	1.2	+.2	.	2.3	+.2	+.2	+.2	.	.	+	.	64
Cynosurus echinatus	.	.	.	+	.	.	+	.	.	.	.	18
Char. all.:												
Salvia officinalis	+.2	1.2	.	2.3	+.3	+.2	+.2	.	.	+.2	2.2	73
Euphorbia spinosa	.	.	1.2	.	.	.	+.2	.	+.2	.	+.2	36
Astragallus muelleri	.	.	.	.	.	+.2	+.2	.	+.2	+.2	.	36
Potentilla australis	.	.	.	.	.	.	.	+	+	+.2	.	27
Helichrisum italicum	.	.	.	.	.	.	+.2	.	.	.	+.2	18
Asphodelus microcarpus	.	.	.	+.2	+	.	.	.	.	.	.	18
Char. order and class:												
Bupleurum veronense	+.2	+.2	1.3	1.3	+.2	+	+	1.2	+.2	+.2	+.2	100
Festuca dalmatica	+.3	2.3	.	1.2	1.2	+.3	+.2	1.2	1.2	1.2	1.3	100
Carthamus lanatus	+	.	+	+.2	+	+	+	+	+	+.2	+	91
Koeleria splendens	+.2	.	+.3	1.3	1.3	.	+.2	1.2	1.2	+.2	+.2	82
Koeleria macrantha	1.2	+.2	.	.	.	1.2	+.2	1.2	1.2	+.2	+.2	73
Dactylis hispanica	+.2	.	+.2	+.2	+.2	+.2	+.2	.	.	+.2	+	73
Scorzonera villosa	+.2	+.2	+	+	1.2	.	.	.	+.2	.	.	55
Allium sphaerocephalon	+	.	.	+	+	+	+	.	.	.	+	55
Galium corrudaefolium	+	.	.	+.2	+.2	+	.	.	.	.	.	36
Allium flavum	.	.	+	+	.	+	+	.	.	.	.	36
Muscari comosum	+	+	.	.	.	+	+	.	.	.	.	36
Melica ciliata	+.2	1.2	.	+.2	.	.	.	.	.	.	.	27
Linum tenuifolium	.	.	.	.	+	.	.	.	.	.	+	18
Euphorbia fragifera	.	+.2	.	.	.	.	.	.	.	.	.	9
Anthyllis rubicunda	.	.	.	.	.	.	.	.	.	.	+	9
Dianthus tergestinus	.	.	.	+	.	.	.	.	.	.	.	9
Eryngium amethystinum	.	.	.	.	.	.	.	.	.	+	.	9
Fritilaria gracilis	+	.	.	.	.	.	.	.	.	.	.	9
Petrorarghia saxifraga	.	.	.	.	+	.	.	.	.	.	.	9
Tragopogon porrifolius	.	.	.	.	.	.	.	+	.	.	.	9
Trifolium campestre	.	.	.	.	.	+	.	.	.	.	.	9
Diff. order:												
Carduus mycropterus	+	.	+	+	.	+	+	+	.	+	+	73
Micromeria juliana	+.2	.	+.2	.	+.2	.	.	.	.	.	.	27
Tanacetum cineraiifolium	.	+.2	.	.	.	.	+.2	.	.	.	.	18
Comp:												
Avena fatua	.	.	1.2	1.2	.	+.2	+.2	1.2	1.2	1.2	+.2	73
Dorycnium hirsutum	+.2	.	1.2	+.2	1.2	+.2	+.2	.	.	+.2	+.2	73
Hypericum veronense	+.2	.	1.2	+.2	+.2	+.2	.	+.2	+.2	+.2	.	73
Asparagus acutifolius	+.2	+.2	.	.	.	+.2	.	+.2	+.2	+.2	+.2	64
Teucrium polium	+.2	.	.	+.2	.	.	+.2	+	+.2	+.2	+.2	64
Crupina crupinastrum	.	.	+	.	+.2	.	+.2	+.2	+.2	+.2	.	55
Convolvulus cantabricus	+.2	.	+.2	+.2	+.2	+.2	.	.	.	.	.	45
Plantago lanceolata	.	.	+.2	.	+.2	.	.	+.2	+.2	+.2	.	45
Euphorbia wulfenii	+.2	.	.	.	+.2	+.2	.	.	+.2	.	.	36
Picris echioides	.	.	+.2	+.2	.	.	.	+	.	.	+	36
Coronilla emeroides	.	+.3	.	.	.	+.2	.	.	.	.	+.2	27
Allysanthus sinuatus	+.2	+.2	+.2	.	.	.	.	.	.	.	.	27
Aethionema saxatile	.	+	.	.	+	.	.	+	.	.	.	27
Chaerophyllum coloratum	+	+	.	.	.	+	.	.	.	.	.	27
Daucus major	.	.	.	+	.	.	+	.	.	.	+	27
Silene angustifolia	.	.	+	+	.	+	.	.	.	.	.	27
Tordylium apulum	+	.	+	.	.	+	.	.	.	.	.	27
Fumana ericoides	.	.	+.2	.	+.2	.	.	.	.	.	.	18
Onobrychis aequidentata	.	.	.	.	+.2	.	.	.	.	.	+.2	18
Trifolium stellatum	.	.	+.2	.	+.2	.	.	.	.	.	.	18
Nigella damascena	.	.	+	+.2	.	.	.	.	.	.	.	18
Trifolium angustifolium	.	.	.	+.2	+	.	.	.	.	.	.	18

Trigonella corniculata	.	.	.	.	.	+.2	+	.	.	.	.	18
Centaurium erithraea	.	.	.	.	.	-	+	.	.	.	.	18
Echium parviflorum	.	.	+	+	.	.	.	.	.	.	.	18
Filago germanica	.	.	.	.	.	.	.	.	+	+	.	18
Iris illyrica	.	.	.	.	.	.	+	.	.	+	.	18
Orobanche sp.	.	+	.	.	.	+	.	.	.	.	.	18
Vicia sp.	.	.	.	+	+	.	.	.	.	.	.	18
Hyparrhenia hirta	.	1.2	.	.	.	.	.	.	.	.	.	9
Cistus creticus	.	.	.	.	.	.	+.2	.	.	.	.	9
Coronilla scorpioides	.	.	.	.	.	.	.	.	.	.	+.2	9
Juniperus macrocarpa	.	.	.	.	+.2	.	.	.	.	.	.	9
Melilotus indica	.	.	.	.	.	+.2	.	.	.	.	.	9
Pistacia terebinthus	.	.	.	.	.	.	.	.	.	.	+.2	9
Spartium junceum	.	.	.	.	.	.	+.2	.	.	.	.	9
Allium subhirsutum	.	+	.	.	.	.	.	.	.	.	.	9
Coronilla cretica	+	.	.	.	.	.	.	.	.	.	.	9
Geranium columbinum	.	.	.	.	.	.	.	.	.	.	+	9
Rumex sp.	.	.	.	.	.	+	.	.	.	.	.	9
Scolymus hispanicus	.	.	.	.	.	.	.	+	.	.	.	9

Tab. 7. Ass. *Koelerio-Festucetum illyricae* (H-ić. 1962)Trinajstić 1992 subass. *brachypodietosum retusi* Trinajstić 1992

No. of veget. record	1	2	3	? (%)
Size of veget. record (m^2)	50	50	50	/
No. of species	20	20	8	/
Char. all., order and class:				
Cistus creticus	2.3	3.3	4.4	100
Cistus salvifolius	2.3	.	.	33
Dorycnium hirsutum	.	+.2	.	33
Juniperus macrocarpa	.	.	+.2	33
Comp:				
Brachypodium retusum	1.3	1.2	3.3	100
Carduus micropterus	+	+	+	100
Coronilla emeroides	+.3	+.2	.	67
Salvia officinalis	+.2	1.2	.	67
Asparagus acutifolius	+.3	+.2	.	67
Pistacia lentiscus	+.3	+.2	.	67
Briza maxima	+.2	+.2	.	67
Koeleria macrantha	.	+.2	+.2	67
Bupleurum veronense	.	+	+.2	67
Crupina crupinastrum	.	+	+	67
Pinus halepensis	+	+	.	67
Daucus major	.	1.1	.	33
Phillyrea media	+.3	.	.	33
Euphorbia spinosa	+.3	.	.	33
Allysanthus sinuatus	+.2	.	.	33
Euphorbia wulfenii	+.2	.	.	33
Festuca dalmatica	.	+.2	.	33
Helichrisum italicum	.	+.2	.	33
Koeleria splendens	.	+.2	.	33
Micromeria juliana	+.2	.	.	33
Olea sylvestris	+.2	.	.	33
Pistacia terebinthus	.	.	+.2	33
Ruscus aculeatus	+.2	.	.	33
Teucrium pollium	.	+.2	.	33
Aethionema saxatile	+	.	.	33
Muscari comosum	.	+	.	33
Pirethrum cinerariifolium	+	.	.	33
Scleropoa rigida	+	.	.	33
Tragopogon porrifolius	.	.	+	33
Trigonella corniculata	.	+	.	33

Tab. 8. Stadium *Cistus creticus*

No. of veget. record	1	2	3	4	5	6	?(%)
Size of veget. record (m^2)	100	100	100	100	100	100	/
No. of species	18	10	11	16	20	11	/
Char. ass.:							
A *Pinus halepensis*	4.1	4.1	3.1	4.1	3.1	3.1	100
B *Pinus halepensis*	+	.	.	.	.	.	17
Diff. ass.:							
B *Pistacia lentiscus*	2.3	1.3	1.2	+.2	2.3	2.2	100
Char. all.:							
B *Prasium majus*	.	.	+.3	+.2	+.2	1.2	67
Juniperus phoenicea	+.2	.	+.2	.	.	+.3	50
Olea europaea	.	.	+.3	.	1.2	.	33
Myrtus communis	+.3	+.2	.	.	.	.	33
Juniperus macrocarpa	+.2	.	.	.	.	+.2	33
Olea sylvestris	+.2	.	.	+.2	.	.	33
Ceratonia siliqua	+.2	.	.	.	.	.	17
Arbutus unedo	.	.	.	.	+		17
Char. order and class:							
B *Phillyrea media*	+.2	.	.	1.2	+	+.2	67
Pistacia terebinthus	+.2	.	.	+2	.	.	33
Viburnum tinus	.	.	.	.	1.2		17
Ephedra fragilis	+.3	.	.	.	.	.	17
Spartium junceum	.	.	+.3	.	.	.	17
Quercus ilex	.	.	.	.	.	+.2	17
Lonicera implexa				.	+		17
C *Asparagus acutifolius*	+.3	+	.	+.2	+.3	+.2	83
Rubia peregrina	+.3	.	+.2	.	+.2	+.2	67
Smilax aspera	+.2	2.3	+.2	.	.	.	50
Allium subhirsutum	.	.	.	+	+	+	50
Ruscus aculeatus	.	.	.	1.2	+.2	.	33
Cyclamen repandum	.	.	.	.	2.2		17
Carex distachya	+.2	.	.	.	.	.	17
Comp:							
Brachypodium retusum	2.3	+	2.2	3.3	2.3	4.3	100
Coronilla emeroides	+.2	.	+.2	+.2	1.2	.	67
Salvia officinalis	.	.	.	+.2	+.2	.	33
Sesleria autumnalis	.	+.2	.	.	+.2	.	33
Prunus mahaleb	.	+	+	.	.	.	33
Geranium columbinum	.	.	.	+.3	.		17
Dorycnium hirsutum	.	.	.	.	+.2	.	17
Fraxinus ornus	.	+.2	.	.	.	.	17
Mercurialis annua	.	.	.	+.2	.		17
Asplenium trichomanes	.	.	.	.	+		17
Briza maxima	+	.	.	.	.	.	17
Celtis australis	.	+	.	.	.	.	17
Muscari comosum	.	.	.	+	.		17
Rhagadiolus stellatus	.	.	.	.	+		17
Sonchus sp.	.	.	.	+	.	.	17

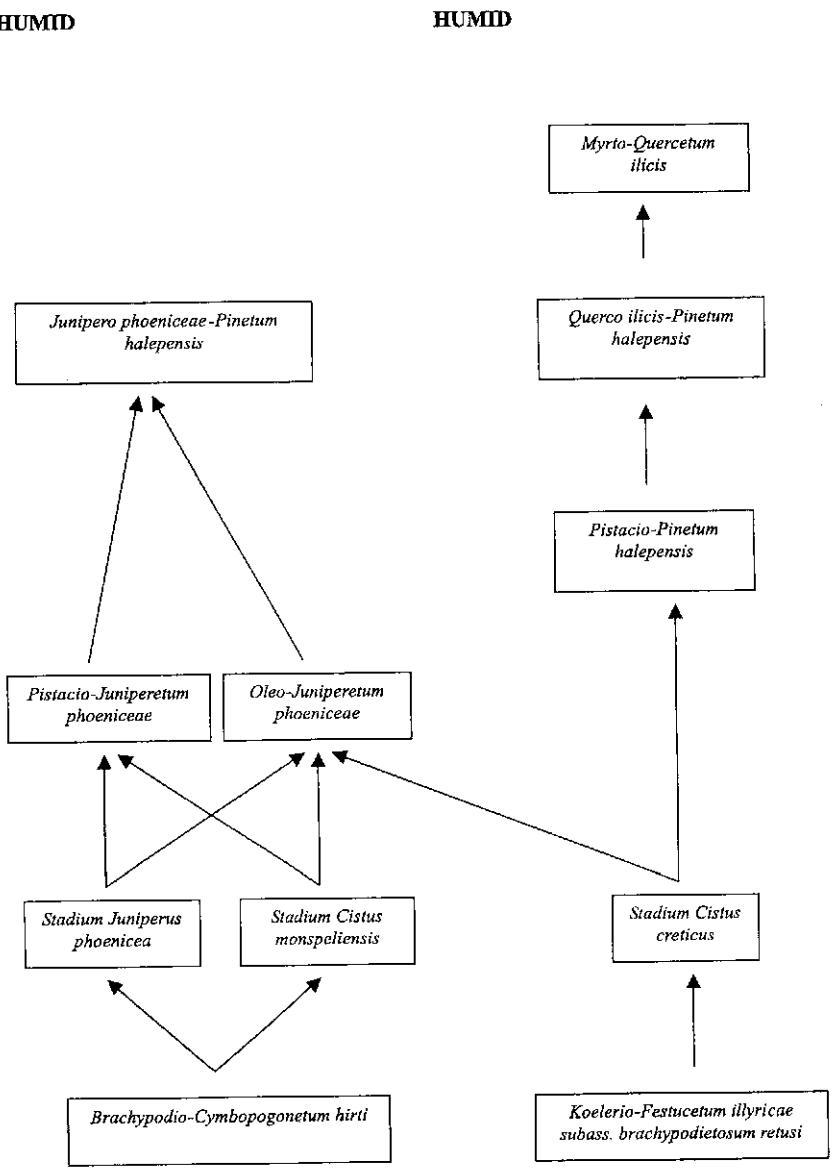
Tab. 9. Ass. *Pistacio-Pinetum halepensis* De Marco, Veri et Caneva 1984

No. of veget. record	1	2	3	4	?(%)
Size of veget. record (m^2)	100	100	100	100	/
No. of species	12	13	28	19	/
Char. ass.:					
A *Pinus halepensis*	3.1	2.1	1.1	3.1	100
B *Pinus halepensis*	.	.	.	+	25
Diff. ass.:					
A *Quercus ilex*	.	.	1.2	1.2	50
B *Quercus ilex*	3.3	3.2	2.2	+.2	100
Char. all.:					
B *Juniperus macrocarpa*	+	.	+	+	75
Olea europaea	+.2	.	.	1.1	50
Olea sylvestris	.	+.3	+.3	.	50
Myrtus communis	.	.	.	+.2	25
Juniperus phoenicea	.	.	.	+	25
Char. order and:					
B *Pistacia lentiscus*	1.3	+.3	1.2	+.2	100
Phillyrea media	+	.	.	+.2	50
Clematis flammula	.	.	+.2	.	25
Juniperus oxycedrus	.	+.2	.	.	25
Lonicera implexa			+.2		25
Spartium junceum	.	+.2	.	.	25
C *Rubia peregrina*	1.2	.	+.2	1.3	75
Asparagus acutifolius	1.2	.	+.2	+	75
Carex distachya	+.2	.	+.3	+.2	75
Smilax aspera	1.3	.	.	+.2	50
Ruscus aculeatus	.	.	+.3	.	25
Comp.:					
Brachypodium retusum	2.3	+.2	1.2	4.5	100
Coronilla emeroides	+.3	+.2	+.2	1.2	100
Cistus creticus	.	+.3	+.2	2.3	75
Salvia officinalis	.	+.3	+.2	1.3	75
Geranium columbinum	.	+	+.2		50
Ceterach officinarum	.	.	.	1.3	25
Sesleria autumnalis	.	.	1.2	.	25
Paliurus spina christi	.	.	1.2	.	25
Anemonae hortensis	.	.	+.2	.	25
Carduus mycropterus	.	.	+.2	.	25
Euphorbia wulfenii	.	+.2	.	.	25
Prunus mahaleb	.	+.2	.	.	25
Tamus communis	.	.	+.2	.	25
Arabis turita	.	.	+	.	25
Centaurium erithraea	.	.	+		25
Hyeracium sp.			+		25
Melica ciliata	.	.	+	.	25
Mercurialis annua	.	.	+		25
Muscari comosum	.	.	+		25
Phagnalon rupestre	.	.	+		25
Satureja montana	.	.	.	+	25

Tab. 10. Ass. *Querco ilicis-Pinetum halepensis* Loisel 1971

No. of veget. record	1	2	3	4	5	6	?(%)
Size of veget. record (m^2)	200	200	200	100	200	200	/
No. of species	20	18	27	24	22	24	/
Char. ass.:							
B *Myrtus communis*	1.3	1.2	2.3	+.2	3.3	+.3	100
C *Myrtus communis*	.	+	.	.	.	.	17
Diff. ass.:							
B *Prasium majus*	.	.	+.2	+.2	+	+	67
Juniperus phoenicea	.	.	1.2	.	+	.	33
Olea europaea	.	.	+.2	.	.	+.2	33
Ephedra campylopoda	.	.	+.3	.	.	.	17
Olea sylvestris	.	.	.	+.2	.	.	17
Char. all., order and class:							
A *Quercus ilex*	1.1	4.1	1.1	1.1	4.1	4.3	100
Pinus halepensis	.	.	.	.	1.1	.	17
Juniperus oxycedrus	.	.	.	.	+	.	17
B *Quercus ilex*	2.4	3.3	3.3	3.3	3.3	1.3	100
Pistacia lentiscus	+.3	1.3	1.2	+.2	1.2	1.3	100
Juniperus oxycedrus	+.2	+	1.2	+	+.2	+	100
Phillyrea media	1.3	1.3	.	+.2	+.2	+	83
Juniperus macrocarpa	+.2	(+)	+.2	+	+.3	.	83
Spartium junceum	.	.	+.2	+	+.2	+	67
Lonicera implexa	+	.	.	+.3	.	.	33
Rosa sempervirens	.	1.2	.	.	.	.	17
Arbutus unedo	+	.	.	.	.	.	17
Laurus nobilis	.	.	.	.	.	+	17
Osyris alba	.	.	.	.	+	.	17
Viburnum tinus	+	.	.	.	.	.	17
C *Rubia peregrina*	1.3	1.3	1.3	+	1.3	+.3	100
Carex distachya	1.2	1.2	+.2	+.2	+.2	+.2	100
Asparagus acutifolius	+	1.2	1.1	+	+	+	100
Smilax aspera	1.3	2.3	2.3	.	2.3	3.4	83
Cyclamen repandum	1.2	2.3	.	+	+.3	2.3	83
Ruscus aculeatus	3.3	4.4	.	+	.	+	67
Clematis flammula	.	.	+.2	+	+	1.3	67
Allium subhirsutum	.	.	+	+	.	+	50
Arum italicum	.	+	.	.	.	.	17
Quercus ilex	+	.	.	.	.	.	17
Teucrium flavum	.	.	+	.	.	.	17
Viburnum tinus	+	.	.	.	.	.	17
Comp.:							
Coronilla emeroides	2.2	1.2	+.2	+	1.2	1.3	100
Tamus communis	.	+	+	+	+	1.3	83
Brachypodium retusum	.	.	2.3	1.3	+.2	+.3	67
Rubus dalamatinus	+	+	.	.	.	1.2	50
Cistus creticus	+.2	.	+.2	.	.	.	33
Cistus salvifolius	+.2	.	.	+.2	.	.	33
Salvia officinalis	.	.	+.2	+	.	.	33
Fraxinus ornus	.	.	+	.	.	+	33
Prunus mahaleb	.	.	+	.	.	+	33
Ceterach officinarum	.	+.2	.	.	.	.	17
Cistus monspeliensis	.	.	.	+.2	.	.	17
Dorycnium hirsutum	.	.	.	+.2	.	.	17
Helictotrichon convolutum	.	.	+.2	.	.	.	17
Biarum tenuifolium	.	.	+	.	.	.	17
Geranium purpureum	.	.	+	.	.	.	17
Paliurus spina-christi	.	.	.	.	+	.	17

Tab. 11 Ass. *Myrto-Quercetum ilicis* (H-ić.)Trinajstić 1985



Picture 2. Succession of vegetation on the island Čiovo

Class:	Species:	Associations:	*Brachypodio-Cymbopogonetum hirti*	*Koelerio-Festucetum illyricae subass. brachypodietosum r.*	*Stadium Cistus monspeliensis*	*Stadium Cistus creticus*	*Stadium Juniperus phoeniceae*	*Pistacio-Juniperetum phoeniceae*	*Oleo-Juniperetum phoeniciae*	*Junipero phoeniceae -Pinetum halepensis*	*Pistacio-Pinetum halepensis*	*Querco ilicis -Pinetum halepensis*	*Myrto -Quercetum ilicis*
Thero-Brachypodietea	*Brachypodium retusum*		100	100	100	100	100	100	100	100	100	100	67
	Convolvulus cantabricus		100	45	50								
	Galium corrudaefolium		100										
	Heteropogon contortus		100				100						
	Hyparrhenia hirta		100				67						
	Fumana ericoides		80										
	Teucrium polium		60	64		43	100						
	Allium subhirsutum		40								50		50
	Briza maxima			64			100						
Festuco-Brometea	*Bupleurum veronense*			100		67	67						
	Festuca dalmatica			100									
	Carthamus lanatus			91									
	Koeleria splendens			82									
	Salvia officinalis		60	73	75	67	67	71	50	44		50	
	Dactylis hispanica		40	73						44			
	Koeleria macrantha			73		67							
	Teucrium flavum		40	64									
	Allium sphaerocephalon			55									
	Festuca illyrica			55									
	Scorzonera villosa			55									
	Satureja montana		40		100								
	Euphorbia spinosa		60		50								
	Petrorhagia saxifraga		100										
	Seseli tomentosum		100										
	Scilla autumnalis								88				
	Teucrium chamaedrys							43					
	Euphorbia fragifera		40										
Erico-Cistetea	*Cistus monspeliensis*				100			43					
	Cistus creticus				75	100		71	63			75	
	Fumana ericoides				75								
	Dorycnium hirsutum			73									
	Cistus incanus		40										
Quercetea ilicis	*Pistacia lentiscus*				100	67		100		56	100	100	100
	Juniperus phoenicea						100	100	100	100	50		
	Pinus halepensis					67				100	100	100	
	Asparagus acutifolius		60	64	75	67	100	100		89	83		100
	Juniperus macrocarpa		40				100	86	100	100		75	83
	Quercus ilex							29				100	100
	Olea europaea							71	100	44		50	
	Olea sylvestris							29	100	67		50	
	Rubia peregrina							43		44	67		100
	Phillyrea media							14	75	56	67	50	83
	Prasium majus		40					57			67		67
	Smilax aspera							71			50		83
	Spartium junceum				50			29					67
	Ceratonia siliqua							57					
	Ephedra fragilis		40					43					
	Lonicera implexa							29					
	Pistacia terebinthus				50								

Tab. 12. The frequency of characteristic species of vegetation classes within all researched associations (over 40%)