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COMMUNITIES WITH PREDOMINATING *ARTEMISIA VULGARIS* AND SOME OTHER RUDERAL COMMUNITIES IN SUBMEDITERRANEAN SLOVENIA

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ABSTRACT

The work deals with some nitrophilous and ruderal communities in Submediterranean Slovenia. They are classified within the Artemisienea. The following associations are discussed: Echio-Melilotetum R. Tx. 1947, Foeniculo-Artemisietum vulgaris Poldini 1980, Tanaceto-Artemisietum vulgaris Sissingh 1950, Arctio-Artemisietum vulgaris Oberd. et al. ex Seybold et T. Müller 1972.

Key words: *Artemisia vulgaris*, ruderal Communities, Submediterranean Slovenia

Ključne besede: *Artemisia vulgaris*, ruderalne združbe, submediteranska Slovenija

INTRODUCTION

In Europe, the investigations of ruderal communities have a long history. As early as 1952, Tüxen wrote *Grundriss einer Systematik der nitrophilen Unkrautgesellschaften in der eurosibirischen Region Europas.* Then he made a synthesis of the existing knowledge which represent a basis for the researches on weed communities in Europe. Later on a synthetic survey of this type of vegetation appeared in South Germany, T. Müller (1981) and Austria, Mucina (1993).

In the region the first work referring to this type of vegetation was carried out by Poldini (1980). In the Karst region of Trieste and Gorizia the following associations were observed: *Foeniculo-Artemisietum, Arctio-Ballotetum nigrae, Echio-Melilotetum,* and *Artemisio-Melilotetum albae.* The weed vegetation of vineyards in the neighbouring Goriško was elaborated by Seljak (1989). Recently two authors have investigated the ruderal vegetation in the researched area. Poldini (1989) stated *Arctio-Artemisietum, Foeniculo-Artemisietum, Dauco-Picridetum* and *Echio-Melilotetum.* However, all Poldini's relevés were made on the Italian side of the border. In Slovenia, the ruderal vegetation was investigated by Kaligarič (1992) who mentioned *Dauco-Picridetum.*

STUDY AREA

The investigations were carried out in the Submediterranean region as defined by M. Wraber (1969). The relevés were taken from the Koprsko gričevje, the Karst plateau and Brkini. The Koprsko gričevje is a hilly flysch land, the bedrock of the Karst plateau consists of limestone, the bedrock of Brkini of sandstone and marl. The climate at the coast is under the influence of the Mediterranean Sea and can be treated as Submediterranean. Its influence is exerted on the continent (Ogrin, 1993). Some climate data for Koper: the average year temperature is 13.8°C; the average temperature in the coldest month (January) is 4.5°C; the average temperature in the warmest month (July) is 23.3°C, and the average rainfall is 960 mm. The potential vegetation ranges from *Ostryo-Quercetum pubescentis* (Ht.) Trinajstić 1974 in the lowland over *Seslerio-Quercetum petreae* Poldini 1982 to *Seslerio autumnalis-Fageteum* M. Wraber ex Borhidi 1963 at higher altitudes.

METHODS

The relevés were made and elaborated according to the standard procedures as per the Braun-Blanquet method (Braun-Blanquet, 1964). The nomenclature of the plant species follows Trpin & Vreš (1994).

RESULTS

All the presented associations thrive only on ruderal sites; along roads, on rubbish dumps, along outer house walls, etc. The sites are strongly disturbed by man and therefore highly eutrophicated.

Syntaxomical position of the associations

- *Echio-Melilotetum* R. Tx. 1947
- *Foeniculo-Artemisietum vulgaris* Poldini 1980
- *Tanaceto-Artemisietum vulgaris* Sissingh 1950
- *Dauco- Melilotion Görs 1966*
- *Onopordetalia acanthii Br.-Bl.* et *R. Tx. 1943* emend. Görs 1966

Arctio-Artemisietum vulgaris Oberd. *et al.* ex Sybold et T. Müller 1972

- *Arction lappae* R. Tx. 1937
- *Artemisietalia vulgaris* Lohm. in R. Tx. 1947
- *Artemisienea vulgaris* T. Müller in Oberd. 1983
- *Artemisietea* Lohm., Prsg. et R. Tx. in R. Tx. 1950

The class *Artemisietea* includes the associations occurring on the forest edges, river banks and in ruderal sites. Further ruderal associations are classified within the *Artemisienea*. Besides *Artemisienea*, there is also the subclass *Galio-Urticenea* (the *Glechometalia* and the *Convolvuletalia)*, the communities occurring on river banks and forest edges (Čarni, 1994).

Within the *Artemisieanea* there are two orders: the *Artemisietalia* and *Onopordetalia*. The *Onopordetalia* is well distinguished from the *Galio-Urticenea* by many thermophilous, nitrophilous species, like *Daucus carota, Pasinaca sativa, Picris hiracioides, Cichorium intybus,* etc.

The *Artemisietalia* represents ecological transition from the *Galio-Urticenea* to the *Onopordetalia*. It therefore includes some species which are in common with the *Galio-Urticenea (Chaerophyllum aureum, Calystegia sepium)* that differ from the *Onopodetalia*. In the table, *Urtica dioica* can be found in the *Arction* and Artemisietalia group, although it is more characteristic of the *Artemisietea*, since it tends to be more frequent on fresher sites. Consequently it could also be a differential species of the *Artemisietalia*.

The communities, classified within the *Onopordetalia* are ruderal and thermo-xerophilous. This order is most xerophilous in the entire Artemisietea and therefore the species characteristic of fresher sites (the *Galio-Urticenea)* are scarcely found there.

The communities, classified within the *Artemisietalia* thrive on fresher sites than the former ones. They are well differentiated from the *Onopordetalia* by several species of the *Galio-Urticenea,* and from the *Galio-Urticenea* by a number of *Onopordetalia* species. This order therefore holds the central position in the class *Artemisietea.*

Description of associations

Echio-Melilotetum R. Tx. 1947

The association often occurs on dry, thermophilous sites. It can be found in open soils with their bedrock on the surface, or even more frequently in places, where bedrock (stones, sand) is used in order to fortify a road or is deposited as waste. Consequently this association is often found along roads, in parking places and on rubbish dumps. It is a pioneer community on thermophilous and nitrophilous sites.

The characteristic species of these communities are *Melilotus* alba and *M. officinalis;* the differential species is *Echium vulgare* (appears only in the second relevé). Within the association the *Daucus carota, Pastinaca sativa, Picris hieracioides, Artemisia vulgaris, Agropyron repens, Convolulus arvensis* can also be found, to mention only the most common ones. It is linked with the associations of the class *Agropyretea intermedii-repentis.*

Foeniculo-Artemisietum vulgaris Poldini 1980

This association was described by Poldini, who had researched the surroundings of Trieste. In Slovenia, this association is found only on the coast of the Koprsko gričevje and partly in the Karst region. According to Poldini (1980), it replaces the *Tanaceto-Artemisietum,* occurring more inland. This assertion corresponds with our results, since the *Foeniculo-Artemisietum* was found only in the part which is under the influence of the Mediterranean climate, and the *Tanaceto-Artemisietum* in the part, which is most distant from the sea, within the extreme limits of the Submediterranean area (Jelšane), where the influence of the continent is most pronounced.

The dominant species in the stand is *Artemisia vulgaris* and the differential species *Foeniculum vulgare.* There you can find other species of the Onopordetalia, such as *Daucus carota, Pastiaca sativa,* etc. These communities also include *Agropyron repens, Dactylis glomerata and Convolvulus arvensis* to mention only the most common ones.

Tanaceto-Artemisietum vulgaris Sissingh 1950

This association can rarely be found in the region. As already mentioned it occurs only in the regions under

the influence of continental climate. Its sites are slightly fresher than those of the previous associations. In fact, the distance from the sea and at the same time from the hot Mediterranean summer reduces the summer stress (low rainfall and high temperatures in the summer months).

The dominant species in the stand are *Tanacetum vulgare* and the neophyte *Erigeron annuus*. The latter indicates the initial character of the stand. The initiality of the stand is shown also by the fact, that there are many other species which are characteristic of weed and grassland communities, such as *Agropyron repens, Convolvulus arvensis, Dactylis glomerata,* to mention only some of them. But the presence of the whole group of species of the *Artemisietea* s. lat. (such as *Daucus carota, Pastinaca sativa, Picris hieracioides* etc.) confirms the classification of this community within the above mentioned association.

Arctio-Artemisietum vulgaris Oberd. *et al.* ex Seybold et T. Müller 1972

This association is the only one that is classified within the *Arction*. The main difference between the previous associations and this association grows are fresher and the soil is deeper.

Within this association, there are some species which are characteristic of less xerophilous sites and belong, from the syntaxonomic point of view, to the *Galio-Urticenea*, such as *Chaerophyllum aureum* and *Calystegia sepium*. The integration of this community in the *Artemisienea* is besides the species of the *Artemisietea (Artemisia vulgaris, Silene vulgaris)* justified also by several *Onopordetalia* species like *Daucus carota, Pastinaca sativa, Picris hieracioides* and *Cichorium intybus*.

Appendix to Table 1.

Sporadic species: in the relevé n°1: *Aristolochia clematitis 1, Diplotaxis muralis; Koeleria lobata; 2. Cerastium glomeratum 1, Echium vulgare, Trifolium repens, Minuartia rubra, Geranium columbinum, Festuca ovina agg., Vicia tenuifolia, Agropyron caninum; 3. Lathyrus latifolius, Bromus sterilis; 4. Picris echioides, Cynodon dactylon, Verbena officinalis; 5. Dorycnium herbaceum, Chenopodium album, Allium sp., Parietaria officinalis; 6. Erigeron annuus 3, Leucanthemum vulgare agg., Tussilago farfara, Vicia sp., Rubus caesius, Medicago falcata, Euphorbia cyparissias; 7. Arctium tomentosum, Atriplex patula, Lapsana communis, Sanguisoba officinalis; 8. Polygonum persicaria, Reseda lutea, Rumex obtusifolius; 9. Galium aparine, Glechoma hederacea, Myosoton aquaticum, Sonchus arvensis, Taraxacum officinale.*

No of the relevé	1	2	3	4	5	6	7	8	9
Surface (m²)	10	20	20	0	10	20	15	30	20
Number of species	17	23	15	16	18	32	23	20	23
Ass. char. species									
Echio-Melilotetum R. Tx.1947									
Melilotus alba	4	+		+					
Melilotus officinalis		3				+	1	+	
Foeniculo-Artemisietum vulgaris Poldini 1980									
Foeniculum vulgare			1	+	2				
Tanaceto-Artemisietum vulgaris Sissingh 1950									
Tanacetum vulgare						2			
Arctio-Artemisietum vulgaris Oberd. et al. ex Seybold et T. Muller 1972									
Arctium lappa							4	4	3
Char. et diff. species of higher syntaxa									
DAUCO-MELILOTION et ONOPORDETALIA									
Daucus carota	1	3		+	+	1	+	1	+
Pastinaca sativa	+	1	+	+		1	+	+	+
Picris hieracioides	+	1							
Cichorium intybus		+	+	+	+	+	+		
ARCTION LAPPAE et ARTEMISIETALIA									
Urtica dioica			+		+		+	+	2
Galeopsis pubescens						+			1
Chaerophyllum aureum							+	+	
ARTEMISIETEA									
Artemisia vulgaris	2	+	4	4	4	4	2	3	3
Silene vulgaris			+		+	+		+	+
Eupatorium cannabinum	+								+
Cirsium arvense						+	1		
Cirsium vulgare						1		+	
Calystegia sepium						+			+
Dipsacus fullonum							+	+	
OTHER SPECIES									
Agropyron repens	1	+		2	2	+	1	+	1
Convolvulus arvensis	1		+		+	+	+		1
Dactylis glomerata			+	1	1	+	+		+
Achillea millefolium	+	+	+	+					
Lactuca serriola	+					+		+	+
Clematis vitalba		1			2			+	+
Poa trivialis				+		+		+	+
Plantago lanceolata	+			+		+			
Arrhentherum elatius	+				+		+		
Plantago major		+				+	+		
Matricaria chamomilla						+	+	+	
Scabiosa triandra	+								+
Sinapsis arvensis		+							+
Diplotaxis tenuifolia		+	+						
Trifolium pratense		1				+			
Conyza canadensis			+	+					
Rubus ulmifolius			1		+				
Centaurea jacea agg.			+		+				
Mentha longifolia					+	+			
Galeopsis speciosa						+	+		
Sonchus oleraceus						+	+		

Table 1. Artemisia vulgaris dominated and some other ruderal communities.
Tabela 1: Združbe, v katerih prevladuje Artemisia vulgaris in druge ruderalne združbe.

Localities of the relevés: 1. Škocjan, parking place, 3/8-95; 2. Ilirska Bistica, rubbish dump, 12/8-95; 3. Belveder, edge of parking, 2/8-95; 4. Cepki, ruderal place, 2/8-95; 5. Črni kal, roadside, 3/8-95; 6. Jelšane, ruderal place, 13/8-95; 7. Mali Potok, stream bank, 4/8-95; 8. Ilirska Bistrica, ruderal place, 12/8-95; 9. Jelšane, slope along a path, 13/8-95.

POVZETEK

V delu je predstavljena vegetacija, ki jo uvrščamo v podrazred Artemisienea. To je ruderalna, nitrofilna vegetacija, ki jo najdemo ob cestah, na smetiščih, ob stenah hiš itd. Predstavljene so naslednje rastlinske združbe: Echio-Melilotetum R. Tx. 1947, Foeniculo-Artemisietum vulgaris Poldini 1980, Tanaceto-Artemisietum vulgaris Sissingh 1950, Arctio-Artemisietum vulgaris Oberd. et al. ex Seybold et T. Müller 1972.

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