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Consolido-Anthemidetum austriacae — a new segetal association

***Consolido-Anthemidetum austriacae* — nová segetální asociace**

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KROPÁČ Z.[1]) et MOCHNACKÝ S.[2]) (1990): *Consolido-Anthemidetum austriacae* — a new segetal association. — Preslia, Praha, 62 : 103—130.

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A new segetal association on the acidophilous side of the alliance *Caucalidion lappulae* R. Tx. 1950 (order *Secalietalia* BR.-BL. et al. 1936, class *Stellarietea mediae* R. Tx., LOHM. et PREISING 1950) is presented with a higher ratio of taxa belonging to the order *Aperetalia* J. et R. Tx. in MALATO-BELIZ et al. 1960. In Czechoslovakia it is confined to warm and moderately warm climatic regions and occurs in the planar and colline belts. Two subassociations have been distinguished and both divided into three variants. Results of floristic-phytosociological, ecological, geographical and agricultural analyses are presented. A comparative analysis with related associations described up to now is also given.

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INTRODUCTION

In 1981, one of the authors of the present paper published the first survey of weed associations for the territory of Czechoslovakia (KROPÁČ 1981). In that survey, which was based upon a synthesis of authentic relevés taken by the author in the course of the previous 10 to 15 years, some associations were published as „nomina nuda". Among them the *Consolido-Anthemidetum austriacae* was also mentioned as the association of spring-summer agroecophases (for more details see KROPÁČ et al. 1971) within the framework of the alliance *Caucalidion lappulae* R. Tx. 1950. The continuing field research of segetal associations in Czechoslovakia has brought new material of relevés which will serve as a basis for the critical revision of segetal syntaxa and will also reflect the recently running changes in the composition of these communities (KROPÁČ 1988 and partly in press). In this case, the new relevé material from the territory of southeastern Slovakia, collected by one of the authors (Mochnacký) in the years 1980—1986, confirms the existence of the association and simultaneously demonstrates the developmentary trends in the association. The paper contains both results obtained not long ago (1962—1974) as well as in recent time, and represents valid publication of this new association for the territory of Czechoslovakia, following the Code of the phytosociological nomenclature (BARKMAN et al. 1986).

THEORETICAL AND METHODIC APPROACHES

The authors have started from the theoretical conception of the ecological-floristic differentiation of segetal communities, i.e. essentially from the principles of the Braun-Blanquet school; of course, they take this differentiation under the influence of agroecological factors more consequently into account (cf. KROPÁČ et al. 1971). This association under study therefore does not comprises relevés of the so-called winter agroecophases from the same agroecotope. The association is delimited by diagnostically significant species which represent the combination of differential species with a high constancy and usually also with a high dominance. This principle was already used in a number of foregoing contributions (KROPÁČ et HEJNÝ 1975, KROPÁČ 1978, 1981). The cover-abundance values in the tables are expressed by means of the 7-degree Braun-Blanquet scale, into which the values of the 11-degree Domin-Hadač scale used by Kropáč were transferred (the mark "-" expresses a solitary occurrence with reduced vitality). The authors took relevés of stands covering areas of ± 100 m². As a framework for the hierarchic classification of syntaxa, we used the new proposal presented by Slovakian authors (KRIPPELOVÁ et MUCINA 1988). Besides, we hold for purposeful to include the highest syntaxon, viz. the division *Convolvulo-Chenopodiea* KRIPPELOVÁ 1978, by which numerous segetal and ruderal species (above all significant dominants) are better taken into account. Thus, their role in the agrophytocenosis from the viewpoint of the contact communities and of the syngenesis of segetal communities becomes more evident.

The nomenclature of idiotaxa is given according to the publication by NEUHÄUSLOVÁ et KOLBEK (1982). In species involving several subspecies or varieties, if not otherwise stated, the autonymous infraspecific taxon is assumed.

The localities of relevés are introduced by the numerical code as used in the mapping of the Central European flora and in the recently prepared phytogeographical atlas of the Czech Republic (for more details see SLAVÍK 1971, 1986). The first two digits indicate the respective horizontal strip (width 6′ of latitude), the second pair of digits marks the vertical strip (width 10′ of longitude).

CHARACTERISTICS OF THE NEW ASSOCIATION

Consolido (regalis) — Anthemidetum austriacae ass. nova hoc loco

Nomenclatural type: Table 1, relevé no. 1, holotype

Phytosociological composition and classification in the system of syntaxa

The association is characterized by a high (over 80 %) or moderately high constancy (over 60 %) of the species *Anthemis austriaca*, *Consolida regalis* and *Centaurea cyanus*, i.e. by the typical combination of species belonging to the alliance *Caucalidion* (the first two species), and by the species of the order *Aperetalia*[1]).

Furthermore, with the intermediate to low constancy, the other species of the alliance *Caucalidion* (first of all *Melandrium noctiflorum*) and of the order *Secalietalia* including the alliance *Sherardion* are present (cf. KROPÁČ 1978); a more significant role among them is played especially by *Papaver rhoeas*, *Avena fatua*, *Sinapis arvensis*, *Medicago lupulina*, and locally also by *Vicia grandiflora*. As a characteristic feature the occurrence of numerous taxa of the order *Aperetalia* appears; in the intermediate class of constancy (40.1 —

[1]) The fact that we respect the system with the class *Stellarietea mediae* does not imply that we follow the classification of the species both into this class and into the lower syntaxa (cf. rather different classification in KRIPPELOVÁ et MUCINA 1988). The species *Anthemis austriaca* and *Consolida regalis* are — on the basis of unpublished synthesis (Kropáč) — optimally attachable to the alliance *Caucalidion lappulae* whereas *Centaurea cyanus* to the order *Aperetalia*, *Neslia paniculata* to the order *Secalietalia*, etc. Of course, this classification of species into certain syntaxa cannot be absolute and will be changed along with the intensifying regional investigation (as far as the suitable objects of segetal communities are still to be found). The more extensive syntheses from the neighbouring territories (e.g. SCHUBERT et MAHN 1968, HOLZNER 1973, OBERDORFER 1983) support in the main the classification of species as used in this paper.

60 %) especially *Raphanus raphanistrum*, *Vicia hirsuta*, *V. tetrasperma*, and *Chamomilla recutita* are represented. This presence of species with higher to intermediate constancy indicates distinctly the position of the association at the boundary between the alliances *Caucalidion* and *Aphanion*, if need be between the orders *Secalietalia* and *Aperetalia*. A more detailed analysis of the presence of taxa in the intermediate to higher classes of constancy speaks for the majority of the *Secalietalia* over the *Aperetalia* by the ratio of 8 : 5 and is expressed already in the diagnostic group by the ratio of 2 : 1. Because of this fact it is reasonable to classify the association into the alliance *Caucalidion* and the order *Secalietalia*. Furthermore, with a higher to intermediate constancy the species of the class *Stellarietea mediae* (*Viola arvensis*, *Stellaria media*, *Fallopia convolvulus*, *Matricaria perforata*, *Anagallis arvensis*, *Capsella bursa-pastoris*) and of the division *Convolvulo-Chenopodiea* (*Chenopodium album*, *Convolvulus arvensis*, *Cirsium arvense*, *Elytrigia repens*, *Polygonum aviculare* agg.) are represented; some of them are of a greater agricultural importance as troublesome weeds[2]).

Synmorphology and life forms of the association

The association develops in the stands of cereals, especially those of winter wheat and winter rye. It consists mostly of three-layer stands of weeds which are limited by the height of the cereals (80—150 cm). The upper herb layer is formed by *Papaver rhoeas*, *Centaurea cyanus*, *Avena fatua*, *Sinapis arvensis*, *Apera spica-venti*, *Raphanus raphanistrum*, *Vicia hirsuta*, *V. tetrasperma*, *Fallopia convolvulus*, *Matricaria perforata*, *Convolvulus arvensis*, *Cirsium arvense*, *Elytrigia repens*, *Galium aparine*, *Descurainia sophia*. The substantial part of the phytomass of weed community is concentrated here. The middle herb layer consists of the species *Anthemis austriaca*, *Consolida regalis*, *Melandrium noctiflorum*, *Thlaspi arvense*, *Chamomilla recutita*, *Viola arvensis*, *Capsella bursa-pastoris*, *Chenopodium album*, etc. The lower herb layer is formed by species using the free spots in the agrophytocenosis and gives rise to limited ecological microspaces — ecological niches, which are also often marked by microrelief with optimal light and moisture conditions. Some of them achieve their optimum of growth and development either in early spring (this ecophase was not studied) or after receiving more light in stands, when the leaf blades of cereals are drying-up. This ground layer consists of *Stellaria media*, *Anagallis arvensis*, *Medicago lupulina*, *Lamium amplexicaule*, *Scleranthus annuus*, *Polygonum aviculare* agg., *Plantago major* subsp. *major* et subsp. *intermedia*, *Gypsophila muralis*, *Sagina procumbens*, *Veronica hederifolia* (in the springtime). Stands richest in species are developed at the borders of fields. Towards the interior of fields, the species diversity diminishes. It is caused mainly by the agrotechnical treatments, the effectiveness of which

[2]) The classification of species into the syntaxa as given here may be regarded as tentative. Of course, we lean on the representative synthetic material (Kropáč, ms.), and in the class *Stellarietea mediae* we leave only those taxa which are by their optima bound to the five orders mentioned (cf. Krippelová et Mucina 1988), whereas into the division *Convolvulo-Chenopodiea* we classify those taxa which distinctly overlap the class *Stellarietea* and with a higher constancy and dominance occur first of all in the ruderal communities; it concerns especially the classes *Artemisietea vulgaris*, *Galio-Urticetea*, *Agropyretea repentis*, *Plantaginetea majoris* and *Bidentetea tripartiti* (syntaxonomy and nomenclature see in Hejný et al. 1979), possibly *Epilobietea angustifolii* (cf. Krippelová 1978).

Tab. 1. — *Consolido — Anthemidetum austriacae* asoc. nova subas. *anthemidetosum*

Association	*Consolido-Anthemidetum austriacae*																	
Subassociation	*anthemidetosum*																	
Variant	typical							with *Vicia grandiflora* and *V. pannonica*										
Relevé, no.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	constancy	
Number of species	29	33	31	38	34	27	31	17	17	17	18	17	16	17	18	18	%	class
Triticum vulgare	4	4	5	5	5	.	4	.	.	.	.	.	.	.	.	.		
Secale cereale	.	.	.	.	.	4	.	4	4	4	4	4	4	4	4	4		
Diagnostically significant species of the association:																		
Anthemis austriaca	2	+	3	2	2	3	1	1	+	1	+	+	+	+	+	+	100	V
Consolida regalis	1	+	2	+	2	1	1	1	+	+	+	1	1	+	1	+	100	V
Centaurea cyanus	1	.	.	.	.	—	+	+	+	1	+	3	3	3	2	1	75	IV
Caucalidion species:																		
Melandrium noctiflorum	1	2	1	2	2	—	.	+	+	.	.	.	.	.	.	.	50	III
Euphorbia exigua	1	.	.	1	.	—	.	.	.	.	.	.	.	.	.	.	18,8	I
Secalietalia species (possibly *Sherardion* — S):																		
Papaver rhoeas	1	2	2	1	2	.	.	.	.	.	.	1	+	.	.	.	43,8	III
Avena fatua	2	2	.	1	2	1	.	.	.	.	.	.	.	.	.	.	31,3	II
Sinapis arvensis	.	2	1	1	.	.	2	.	.	.	.	.	.	.	.	.	25	II
Medicago lupulina (dif.)	1	.	.	.	1	.	—	.	.	.	.	.	.	.	.	.	18,8	I
Aethusa cynapium subsp. *agrestis*	.	.	.	2	1	.	.	.	.	.	.	.	.	.	.	.	12,5	I
Galium spurium	.	+	.	.	+	.	.	.	.	.	.	.	.	.	.	.	12,5	I
Neslia paniculata	.	.	.	1	.	.	—	.	.	.	.	.	.	.	.	.	12,5	I
Ranunculus arvensis (S)	.	.	.	2	.	.	1	.	.	.	.	.	.	.	.	.	12,5	I
Buglossoides arvensis	.	.	+	1	.	+	+	.	.	.	.	.	.	.	.	.	25	II
Vicia grandiflora	.	.	.	.	.	.	.	.	.	.	.	+	+	+	+	+	31,3	II
Vicia pannonica	.	.	.	.	.	.	.	+	+	.	.	.	.	.	.	.	12,5	I
Aperetalia species:																		
Raphanus raphanistrum	.	.	.	.	.	.	1	.	.	1	1	+	+	+	+	+	50	III

Tab. 1. (continued)

Association	*Consolido-Anthemidetum austriacae*																	
Subassociation	*anthemidetosum*																	
Variant	typical							with *Vicia grandiflora* and *V. pannonica*										
Relevé, no.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	constancy	
Number of species	29	33	31	38	34	27	31	17	17	17	18	17	16	17	18	18	%	class
Vicia hirsuta	.	.	.	.	+	.	.	+	+	.	.	+	+	+	1	+	50	III
Vicia tetrasperma	.	.	.	.	1	.	+	+	+	+	+	.	.	+	+	+	56,3	III
Chamomilla recutita	.	2	.	.	.	.	.	.	.	1	1	2	1	3	3	1	50	III
Apera spica-venti	3	2	.	.	.	1	.	+	+	.	.	.	.	.	.	.	31,3	II
Myosotis arvensis	.	1	.	1	+	.	+	.	.	.	+	.	.	.	.	.	31,3	II
Papaver argemone	1	.	1	.	.	1	—	.	.	.	.	.	.	.	.	.	25	II
Scleranthus annuus	1	.	.	.	.	.	.	.	.	1	+	.	.	.	.	.	18,8	I
Arabidopsis thaliana (dif.)	.	.	.	.	.	.	.	.	.	.	.	+	+	.	.	.	12,5	I
Chenopodietalia and *Eragrostietalia* species:																		
Thlaspi arvense	1	2	1	3	1	2	3	.	.	.	.	.	.	+	+	+	62,5	IV
Polygonum lapathifolium s.l.	.	.	.	.	1	.	+	1	1	.	.	.	.	.	.	.	25	II
Oxalis fontana	—	.	.	.	.	.	.	.	.	1	1	.	.	.	.	.	18,8	I
Fumaria officinalis	1	.	1	.	+	.	.	.	.	.	.	.	.	.	.	.	18,8	I
Euphorbia helioscopia	.	.	—	1	.	.	.	.	.	.	.	.	.	.	.	.	12,5	I
Polygonum persicaria	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	—	12,5	I
Veronica polita	.	.	+	.	+	.	.	.	.	.	.	.	.	.	.	.	12,5	I
Sisymbrietalia species:																		
Descurainia sophia	.	1	—	.	1	+	+	.	.	.	.	.	.	+	.	+	43,8	III
Stellarietea mediae species:																		
Viola arvensis	1	1	1	2	1	—	.	1	1	+	1	2	1	1	+	1	93,8	V
Stellaria media	.	1	1	1	1	1	1	1	1	+	+	+	+	+	+	+	93,8	V
Fallopia convolvulus	2	1	1	1	2	+	1	+	+	+	+	1	+	.	.	.	81,3	V
Matricaria perforata (*Tripl. inodorum*)	2	1	1	2	2	.	—	+	+	+	+	.	.	.	.	.	62,5	IV
Anagallis arvensis	+	1	.	+	1	+	+	.	.	.	.	.	.	+	+	+	56,3	III
Capsella bursa-pastoris	.	1	+	1	.	—	+	.	.	+	+	.	.	.	.	.	43,8	III
Lamium amplexicaule	.	.	2	1	1	+	+	.	.	.	.	.	.	.	+	+	43,8	III
Lamium purpureum	.	1	1	1	+	.	.	+	+	.	.	.	.	.	.	.	37,5	II

Tab. 1. (continued)

Association	*Consolido-Anthemidetum austriacae*																	
Subassociation	*anthemidetosum*																	
Variant	typical							with *Vicia grandiflora* and *V. pannonica*										
Relevé, no.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	constancy	
Number of species	29	33	31	38	34	27	31	17	17	17	18	17	16	17	18	18	%	class
Sonchus asper	.	.	.	+	+	—	—	.	.	.	.	.	.	.	.	.	25	II
Veronica persica	.	1	1	2	.	+	.	.	.	.	.	.	.	.	.	.	25	II
Atriplex patula	.	1	.	1	.	.	—	.	.	.	.	.	.	.	.	.	18,8	I
Geranium pusillum	.	+	.	.	+	.	.	.	.	.	.	.	.	.	.	.	12,5	I
Veronica hederifolia	.	.	1	2	.	.	.	.	.	.	.	.	.	.	.	.	12,5	I
Convolvulo-Chenopodiea species:																		
Chenopodium album	1	2	1	.	.	+	1	+	+	+	+	+	+	+	+	+	87,5	V
Convolvulus arvensis	1	.	+	.	1	.	+	1	1	+	1	1	+	.	.	.	62,5	IV
Cirsium arvense	1	.	1	1	2	—	.	+	+	+	+	.	.	.	.	.	56,3	III
Elytrigia repens	2	1	1	2	1	+	.	.	.	+	1	.	.	.	.	.	50	III
Polygonum aviculare agg.	2	1	+	2	+	—	1	.	.	.	.	.	.	.	—	.	50	III
Galium aparine	.	.	1	1	1	.	.	.	.	.	.	+	+	.	.	.	31,3	II
Plantago major subsp. *major*	.	.	.	+	.	.	.	.	.	.	.	.	.	+	+	+	25	II
Rumex crispus	.	1	.	1	.	—	+	.	.	.	.	.	.	.	.	.	25	II
Artemisia vulgaris	.	+	.	.	.	.	.	.	.	.	.	+	—	.	.	.	18,8	I
Lapsana communis	.	.	.	2	1	.	.	.	.	.	.	.	.	.	.	.	12,5	I
Poa annua	.	1	1	.	.	.	.	.	.	.	.	.	.	.	.	.	12,5	I
Lactuca serriola	+	—	.	.	.	.	.	.	.	.	.	.	.	.	.	.	12,5	I
Molinio-Arrhenatheretea species:																		
Trifolium repens	.	.	.	.	.	.	.	.	.	.	.	.	.	+	+	+	18,8	I
Taraxacum officinale	1	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	12,5	I

Species recorded in one relevé only (pertinent nos. of the relevé in the brackets): *Arctium tomentosum* — (12), *Asperugo procumbens* — (7), *Campanula rapunculoides* + (5), *Consolida orientalis* 2 (2), *Equisetum arvense* — (15), *Erodium cicutarium* — (6), *Falcaria vulgaris* — (5), *Galeopsis tetrahit* 2 (4), *Galinsoga parviflora* — (2), *Geranium dissectum* 1 (4), *Holosteum umbellatum* 1 (7), *Lathyrus tuberosus* 2 (1), *Linaria vulgaris* — (3), *Lycopsis arvensis* + (7), *Melandrium album* — (1), *Melilotus albus* 1 (1), *Papaver dubium* + (6), *Plantago intermedia* 1 (2), *Ranunculus repens* 1 (4), *Rubus caesius* 1 (4), *Rumex acetosella* — (6), *Stachys annua* 2 (1), *Stachys palustris* — (3), *Vicia angustifolia* 1 (5), *Vicia cracca* + (4), *Vicia villosa* — (7).

Tab. 1. (continued)

Locations of the relevés in Table 1 (with the following sequence of data: topography, slope and its aspects or other character of ground, elevation in m, date, author in the brackets)

1 — 5852: E border of the town Praha-Suchdol, local part called Horní Sedlec, terraces above the valley of Vltava river, mild slope S, 260 m, July 10, 1968 (K)
2 — 5555: ca 600 m E of the cross-roads at the farm Studénka (at the right side of road to the village Násedlnice), locally flat ground, 225 m, August 4, 1972 (K)
3 — 5950: ca in the middle between the settlements Unhošť and Červený Újezd, undulate ground, 390 m, May 20, 1971 (K)
4 — 5845: ca 1.5 km E of the village Albeřice, at the small bridge over the brook called Lochotínský potok, slope ca 15°, aspect SW, 620 m, May 30, 1972 (K)
5 — 5951: town Praha, local part Dolní Liboc, ca 400 m NE of the rock pass near the water reservoir called Džbán, locally flat till undulate ground, 320 m, July 23, 1974 (K)
6 — 5846: ca 1.5 km SW of the village Vroutek, locally flat till undulate ground, 350 m, June 30, 1962 (K)
7 — 5846: ca 0.5 km SW of the village Lužec, locally flat till undulate ground, 360 m, June 30, 1962 (K)
8 — 7298: SW border of the village Závadka, at the left side of road to the village Lúčky, near the small bridge over the water channel called Čierna voda, 105 m, June 7, 1984 (M)
9 — 7298: SE border of the village Nižná Rybnica, at the right side of road, in the cadastre of the village Široké, 110 m, June 7, 1984 (M)
10 — 7398: ca 200 m E of the village Bajany, at the right side to the village Lekárovce, 105 m, June 7, 1984 (M)
11 — 7596: ca 150 m S of the village Brehov, at the right side of road to the village Cejkov, 103 m, June 20, 1984 (M)
12 — 7396: ca 300 m SE of the village Bánovce nad Ondavou, at the left side of road to the village Ložín, 117 m, July 11 1985 (M)
13 — 7696: ca 300 m N of the village Veľký Kamenec at the right side of road to the village Somotor, 110 m, June 20, 1984 (M)
14 — 7696: ca 500 m N of the village Veľký Kamenec, at the right side of road to the village Somotor, 100 m, June 20, 1984 (M)
15 — 7597: ca 3.5 km W of the town Kráľovský Chlmec, near the fork of local road to the village Vojka at the N border of the village Plešany (earlier name of the village: Svätuše), 101 m, June 18, 1984 (M)
16 — 7597: ca 200 m E of the village Plešany (Svätuše), at the left side of road to the town Kráľovský Chlmec, slope ca 15°, 105 m, June 17, 1984 (M)

usually decreases towards the field margins. Also the light input must not be omitted, as along the borders of cereals there is more light than in the dense canopy inside the fields. The cover value of stands of the agrophytocoenosis is dependent on the cover value of crops and on the quality of agrotechnical and chemical treatments. Usually if fluctuates between 70 and 90 %. At some localities in the Východoslovenská nížina Lowland the occurrence of some mushrooms was registered in the wheat and rye stands (Mochnacký), viz. of *Agrocybe dura* (Bolt ex Fr.) Sing. and *Crucibulum laeve* (Huds. ex Relh.) Kambly et al. They occurred mainly in the fields which were manured with stall dung or organic material.

In the association the therophytes (about 80 %) predominate over hemicryptophytes (ca 15 %) and geophytes (ca 5 %). Among the therophytes there are mainly the winter annuals (51 %); of course, many of them represent mixed populations of both winter and spring annuals. Then follow the early-spring annuals (17 %) and late-spring annuals (12 %). Such a spectrum of life forms fully corresponds with the structure of life forms of the other segetal communities and is in conformity with the so-called ruderal strategies of the species present (cf. Grime 1979).

Synchorology, synecology, symphenology and syngenetics of the association

The association has been found up to now in Bohemia, Moravia, and Slovakia in the planar and colline belts (at altitudes predominantly from 100 to 400 m a.s.l., exceptionally at higher altitudes conditioned by the habitat), in warm to moderately warm climatic regions, in dry to moderately dry districts (according to the classification of Konček et al. 1958), in which the annual precipitation totals mostly do not exceed 650 mm. Horizontally it is limited to only certain soils; as regards the soil types, they are in most cases the brown forest soils of medium to low base saturation (on silicate, usually strongly gravelly parent materials) and rhegosols (on sandy and gravelly-sandy parental materials), less frequently the degraded to illimerized chernozems (on loess with gravelly-sandy admixture) and alluvial soils slightly gleyed on rather light substrata (some localities in the Východoslovenská nížina Lowland). As to the soil texture (mechanical composition of arable soil), the loamy-sandy to sandy or sandy-loamy to loamy soils with a high admixture of gravel of predominantly silicate to silicate--carbonate character (usually over 50 %) prevail. The soil reaction of all habitats is slightly acid to neutral. The community arises on plains to hill-lands, where it colonizes moderate slopes facing the south, southeast or southwest, of meso-xerothermic character. Horizontally it links up most frequently with *Euphorbio-Melandrietum* G. Müller 1964 and *Lathyro-Adonidetum* Kropáč et Hadač in Kropáč et al. 1971 (towards the base-rich habitats) as well as with *Aphano-Matricarietum* Tx. 1937 (towards the rather acid and cold loamy sites). From the agricultural viewpoint, the sugar-beet farming zone with rye subzone is involved. The original vegetation was represented by oak-hornbeam and acidophilous oak forest (the thermophilous wing), in the Východoslovenská nížina Lowland also by oak woods with *Quercus cerris*.

The symphenological optimum of the association lies in the spring-summer ecophases with cereals, especially in June and July, when the dominant

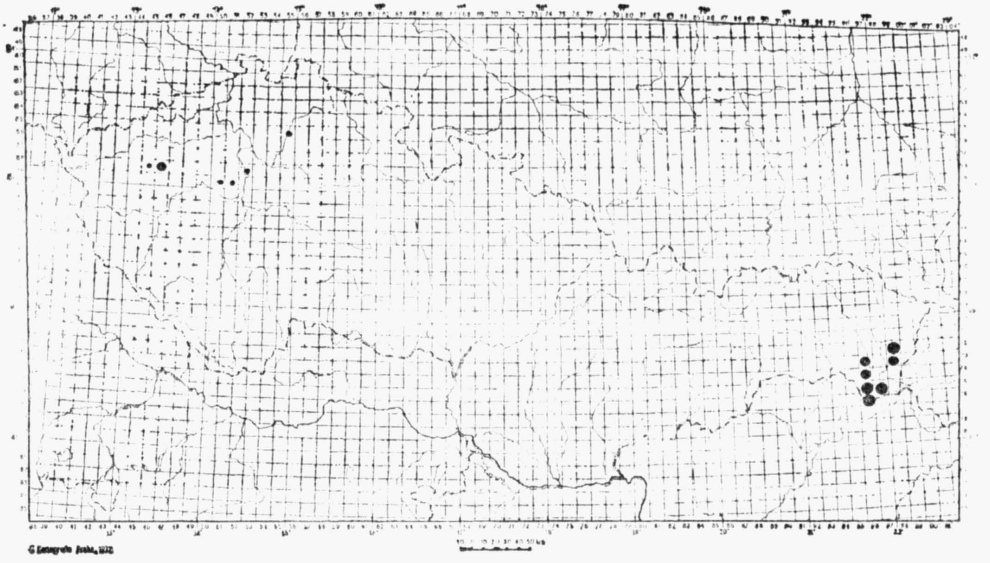

Fig. 1. Distribution of relevés of the *Consolido-Anthemidetum austriacae* subas. *anthemidetosum* in Czechoslovakia; • — one relevé in the square, ● — two relevés in the square, ⬤ — three and more relevés in the square.

species are in full flowering phase. In the second half of July and at the beginning of August the fruiting phase comes on. At that time, as a result of the harvest of cereals, the stands of the association become extinct and can persist in the unistrate layer in stubbles (if no skimming is made) or in fragmentary form in the field margins, etc. The ripening of fruits and seeds of numerous species lies in the time coincidence with the ripening of cereals, so that during the harvest seeds of many species of the community are dispersed and thus the soil seed bank is established, which represents the potential basis of restoration of this community in crop rotation.

From the viewpoint of syngenetics, the *Consolido-Anthemidetum austriacae* develops in the habitats of the ephemeral segetal community *Veronico hederifoliae-triphylli* Slavnić 1951, which develops during the winter agroecophases (optimally in early spring in winter wheat or winter rye).

Variability of the association

The variability of the association is conditioned ecologically (first of all by the soil conditions), geographically, and by the changes in cultural practices on arable soil.

1. subas. *anthemidetosum* (i.e. „typicum")

The autonymous (typical) subassociation (see Fig. 1) colonizes predominantly middle heavy to rather light soils (loamy to sandy-loamy), mostly with a high admixture of carbonate-free gravel and stones (often over 50 %); the soil types are mainly the brown forest soils either saturated or of medium base saturation (on algonkian slates and greywackes, exceptionally also on

Tab. 2. *Consolido — Anthemidetum austriacae* asoc. nova subas. *anthemidetosum*

Association	*Consolido — Anthemidetum austriacae*																
Subassociation	*anthemidetosum*																
Variant	impoverished																
Relevé, no.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	constancy	
Number of species	10	10	14	14	15	11	11	9	9	12	8	14	12	12	12	%	class
Secale cereale	4	4	4	4	4	4	4	4	4								
Triticum vulgare										4	4	4	4	4	4		
Diagnostically significant species of the association:																	
Anthemis austriaca	+	1	3	2	+	1	2	2	1	1	+	+	1	.	+	93,3	V
Consolida regalis	1	1	1	+	+	+	+	1	1	+	1	+	+	+	1	100	V
Centaurea cyanus	3	3	+	+	2	2	2	3	3	1	2	+	1	3	1	100	V
Caucalidion species:																	
Camelina microcarpa	.	.	+	+	.	.	.	.	.	.	.	.	.	—	.	20	I
Lathyrus tuberosus	.	.	1	1	.	.	.	.	.	.	.	.	.	.	.	13,3	I
Secalietalia species (possibly *Sherardion* — S):																	
Papaver rhoeas	.	.	.	.	+	+	+	+	+	+	+	+	—	+	.	66,7	IV
Vicia grandiflora	.	.	.	.	+	.	.	.	.	.	.	.	.	+	1	20	I
Ranunculus arvensis (S)	.	.	.	.	.	.	.	.	.	.	.	—	—	.	.	13,3	I
Aperetalia species:																	
Chamomilla recutita	.	.	.	.	2	.	+	+	1	+	.	+	—	+	.	53,3	III
Vicia hirsuta	+	1	+	+	+	.	+	.	.	.	+	.	.	.	+	53,3	III
Vicia tetrasperma	.	.	+	+	.	.	.	.	.	.	.	.	.	.	+	20	I
Arabidopsis thaliana (dif.)	.	.	1	1	+	.	.	.	.	.	.	.	.	.	.	20	I
Veronica triphyllos	.	.	+	+	.	1	.	.	.	.	.	.	.	.	.	20	I
Myosotis arvensis	+	+	.	.	.	.	.	.	.	.	.	.	.	.	.	13,3	I
Scleranthus annuus	+	+	.	.	.	.	.	.	.	.	.	.	.	.	.	13,3	I

Tab. 2. (continued)

Association	*Consolido — Anthemidetum austriacae*																
Subassociation	*anthemidetosum*																
Variant	impoverished																
Relevé, no.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	constancy	
Number of species	10	10	14	14	15	11	11	9	9	12	8	14	12	12	12	%	class
Chenopodietalia species:																	
Thlapsi arvense	.	.	.	.	.	1	+	.	.	+	.	+	.	.	.	26,7	II
Oxalis fontana	1	1	.	.	.	.	.	.	.	.	.	.	.	.	.	13.3	I
Sisymbrietalia species:																	
Descurainia sophia	.	.	.	.	.	+	2	+	+	2	.	1	+	.	.	46,7	III
Bromus sterilis	.	.	.	.	.	1	+	+	+	+	.	.	.	.	.	33,3	II
Stellarietea species:																	
Viola arvensis	1	1	1	1	1	1	1	1	1	1	1	+	+	+	.	93,3	V
Stellaria media	+	+	+	+	+	+	.	.	.	.	.	1	+	+	.	60	III
Fallopia convolvulus	.	.	.	.	+	.	.	.	.	.	+	+	+	.	.	26,7	II
Veronica persica	.	.	+	+	.	.	.	.	.	.	.	.	.	+	.	20	I
Convolvulo-Chenopodiea species:																	
Convolvulus arvensis	1	1	.	.	+	.	.	+	1	+	1	+	+	+	+	73,3	IV
Chenopodium album	.	.	1	1	+	.	.	.	.	+	.	+	+	.	+	46,7	III
Galium aparine	.	.	.	.	+	1	+	.	.	+	.	.	.	.	.	26,7	II
Molinio-Arrhenatheretea species:																	
Trifolium repens	.	.	+	+	.	.	.	.	.	.	.	.	.	.	.	13,3	I
Rumex acetosa	.	.	.	.	.	.	.	.	.	.	.	.	.	−	+	13,3	I

Species recorded in one relevé only (pertinent nos. of the relevé in the brackets): *Conyza canadensis* + (15), *Echium vulgare* − (14), *Equisetum arvense* + (15), *Raphanus raphanistrum* + (5), *Sonchus arvensis* − (12), *Trifolium arvense* + (15).

Locations of the relevés in Table **2** (with the same sequence of data as in Tab. 1):

1 — 7298: SE of the village Nižná Rybnica, at the left side of road to the town Sobrance, at the brook called Lukavec, 102 m, June 7, 1984 (M)
2 — 7398: SW of the village Bajany, at the right side of road near the cross-roads to Ťahyňa, 109 m, June 7, 1984 (M)
3 — 7597: ca 1 km N of the village Plešany (Svätuše), in the direction to the village Vojka (cadastre Bešeňov), 103 m, May 15, 1985 (M)
4 — 7597: ca 500 m SE of the village Plešany (Svätuše), 100 m, May 15, 1985 (M)
5 — 7396: ca 300 m S of the village Bánovce nad Ondavou, at the left side of road to the village Ložín, 117 m, July 11, 1985 (M)
6 — 7496: ca 200 m NW of the village Sirník, at the left side of road to the village Hraň, 105 m, July 15, 1986 (M)
7 — 7496: SE border of the village Hraň, at the farming buildings (right side of the road to the village Sirník), 103 m, July 18, 1986 (M)
8 — 7596: ca 1 km SW of the village Ladmovce, at the left side of road to the village Viničky, near the river Bodrog, 99 m, June 18, 1986 (M)
9 — 7597: ca 300 m E of the village Plešany (Svätuše), at the left side of road to the town Kráľovský Chlmec, 105 m, June 3, 1986 (M)
10 — 7696: S of the village Somotor, at the left side of road to the village Veľký Kamenec, ca 200 m S of the railway crossing, 100 m, July 8, 1986 (M)
11 — 7696: ca 400 m NE of the village Veľký Kamenec, at the left side of road to the farm called Ružový majer, 100 m, July 10, 1986 (M)
12 — 7596: ca 1.5 km NE of the village Somotor, in the direction to the farm called Kerestúr, near the private vineyards, 102 m, July 16, 1986 (M)
13 — 7596: ca 300 m NE of the village Somotor, at the right side of road to the village Bodrog, 105 m, July 16, 1986 (M)
14 — 7596: ca 500 m NW of the village Zemplín, at the left side of road to the village Cejkov, 107 m, July 17, 1986 (M)
15 — 7596: ca 200 m SW of the village Brehov, at the right side of road to the village Cejkov, 103 m, July 18, 1986 (M)

basaltic substrata) and the brown forest soils of low base saturation (on carboniferous to permian arkoses and sandstones, on algonkian lydites and quaternary loamy sands and gravels), less frequently the rhegosols (on sand), chernozems degraded to illimerized (on loess with admixture of fluvial terrace material), meadow soils (aquolls), illimerized soils and gleyed alluvials. From the floristic point of view, the subassociation is characterized negatively, by absence of the species group of subas. *trifolietosum arvensis* (see Table 1 and 2). The representation of species, however, is not quite even in the autonymous subassociation, and from relevé materials gathered hitherto it was possible to distinguish three variants for the time being:

a) Typical variant (Table 1, left half) — is represented by seven relevés from Bohemia, taken in the years 1962—1974, when the segetal communities were still rather rich in species. In the community of this variant 79 taxa were found in total, and the average number of species per relevé amounted to 31.9. A characteristic feature is the relatively high presence of species belonging to the alliance *Caucalidion* and order *Secalietalia* (possibly to the alliance *Sherardion*), if compared with the next variants. The crop was predominantly winter wheat, only in one case winter rye.

b) Variant with *Vicia grandiflora* and *V. pannonica* (Table 1, right half) — is represented by nine relevés from the Východoslovenská nížina Lowland taken in the years 1984—1985, when under the influence of more years' effect of the intensification factors in plant production a considerable reduction of species in segetal communities already set in. In this case, however, the relevés are still relatively rich in species (in comparison with variant c); in total, 39 taxa were found in the community, and the average number of taxa per relevé amounted to 17.2. A characteristic feature is the presence of *Vicia grandiflora* and *V. pannonica*, which are absent in the foregoing variant; their presence is evidently conditioned geographically. In this variant an impoverishment of the species belonging to the alliance *Caucalidion* and order *Secalietalia* (possibly of the alliance *Sherardion*) and, on the contrary, a certain accentuation of species of the order *Aperetalia* is to be observed. The crop, in which the relevés were made, was exclusively winter rye.

c) The impoverished variant (Table 2) — fifteen relevés are given from the Východoslovenská nížina Lowland predominantly from the year 1986, but only five relevés were taken in the years 1984—1985. The specific impoverishment is already distinctly marked here; in total, 34 taxa were found in the community, the average number of species per relevé amounting to 11.5. This impoverished variant can still be attached to the newly described association (the combination of three species with high constancy is evident); the other alliance and order species, of course, are already strongly reduced. Also quite fragmentary communities were found (Mochnacký), which in an area of ca 100 m^2 included about five species; their classification on the level of association was no longer possible.

2. subas. ***trifolietosum arvensis*** subas. nova hoc loco

This subassociation is distributed (see Fig. 2) on light, predominantly sandy to sandy-loamy soils, consisting on the one hand of solid substrata with typical disintegration (silicate substrata of various origin, first of all

Tab. 3. — *Consolido — Anthemidetum austriacae* asoc. nova subas. *trifolietosum arvensis*

Association	*Consolido — Anthemidetum austriacae*																								
Subassociation	*trifolietosum arvensis*																								
Variant	typical									with *Gypsophila muralis*						with *Anthemis ruthenica*									
Relevé, no.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	constancy		
Number of species	39	45	41	40	40	40	32	33	32	25	21	25	20	19	18	32	29	27	33	23	33	25	%	class	
Triticum vulgare	.	S	4	.	.	5	.	.	5	.	.	.	.	.	4	S	.	.	.	.	.	S			
Secale cereale	.	.	.	4	.	.	.	4	.	4	4	4	4	4	.	.	.	.	4	4	5	.			
Brassica napus var. *arvensis*	5	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.			
Avena sativa		.	.	.	.	.	4	.	.	.	.	.	.	.	.	.	S	.	.	.	.	.			
Faba vulgaris	.	.	.	.	4	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.			
(*Cichorium intybus* var. *sativa*)	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.		4	.	.	.	.			
(S - stubble of crop)																									
Diagnostically significant species of the association:																									
Anthemis austriaca	1	1	1	1	+	2	2	+	1	.	.	4	−	−	.	+	.	.	1	2	.	.	72,7	IV	
Consolida regalis	1	.	+	2	1	1	.	−	2	1	+	+	−	+	+	1	+	.	1	+	.	1	81,8	V	
Centaurea cyanus	1	−	3	.	1	1	.	.	2	1	+	+	2	2	+	.	.	.	1	2	2	.	68,2	IV	
Differentiating species of the subassociation and variants:																									
Trifolium arvense	1	+	2	.	2	−	1	1	.	+	1	2	+	−	2	2	2	.	1	.	1	1	81,8	V	
Conyza canadensis	1	−	.	1	.	.	.	1	+	.	.	.	+	.	+	1	1	1	+	−	.	1	59,1	III	
Setaria viridis	.	3	.	.	.	.	2	1	.	.	.	.	.	.	.	.	+	2	1	.	.	.	27,3	II	
Digitaria ischaemum	.	1	.	1	.	.	1	.	.	.	.	.	.	.	.	1	.	1	.	.	.	1	27,7	II	
Gypsophila muralis	.	.	.	.	.	.	.	.	.	1	+	2	−	.	1	.	.	.	.	.	.	.	22,7	II	
Anthemis ruthenica	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	+	1	2	3	3	1	31,8	II	
Caucalidion species:																									
Melandrium noctiflorum	.	1	.	1	1	1	2	1	.	.	.	.	.	.	.	2	1	.	.	.	.	.	36,4	II	
Euphorbia exigua	.	1	.	1	.	−	2	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	18,2	I	
Stachys annua	.	.	.	.	.	.	.	.	1	+	−	+	.	.	.	.	.	.	.	.	.	.	18,2	I	
Lathyrus tuberosus	.	.	.	.	.	.	2	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	9,1	I	
Camelina microcarpa	+	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	9,1	I	

Tab. 3 (continued)

Association	*Consolido — Anthemidetum austriacae*																						
Subassociation	*trifolietosum arvensis*																						
Variant	typical									with *Gypsophila muralis*						with *Anthemis ruthenica*							
Relevé, no.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	constancy
Number of species	39	45	41	40	40	40	32	33	32	25	21	25	20	19	18	32	29	27	33	23	33	25	% class
Secalietalia species (possibly *Sherardion* — S):																							
Medicago lupulina (dif.)	1	1	.	+	1	1	1	1	.	+	+	—	.	.	.	2	2	+	1	.	.	.	63,6 IV
Papaver rhoeas	+	—	1	.	1	2	.	.	2	.	.	.	+	+	.	1	—	.	+	1	.	.	54,5 III
Sinapis arvensis	.	.	+	.	.	.	—	1	.	—	.	—	.	.	+	.	.	+	.	.	.	.	31,8 II
Vicia villosa	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	2	1	1	.	22,7 II
Aethusa cynapium subsp. *agrestis*	.	1	.	1	.	1	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	18,2 I
Avena fatua	.	1	.	.	.	.	1	.	2	.	.	.	.	.	.	.	.	.	.	.	.	.	13,6 I
Galium spurium	.	.	.	—	.	2	.	—	+	.	.	.	.	.	.	.	.	.	.	.	.	.	18,2 I
Vicia grandiflora	.	.	.	.	.	.	.	.	.	.	.	.	—	—	+	.	.	.	.	.	+	.	18,2 I
Vicia pannonica	.	.	.	.	.	.	.	.	.	+	1	+	.	.	.	.	.	.	.	.	.	.	13,6 I
Ranunculus arvensis (S)	.	.	.	.	.	.	.	.	.	+	+	—	.	.	.	.	.	.	+	.	.	.	18,2 I
Sherardia arvensis (S)	.	.	.	1	1	+	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	18,2 I
Buglossoides arvensis	.	.	1	.	.	—	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	9,1 I
Campanula rapunculoides (dif.)	.	.	.	+	.	.	—	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	9,1 I
Aperetalia species:																							
Raphanus raphanistrum	2	+	1	.	+	1	1	.	+	.	.	.	.	.	.	2	2	+	1	+	—	.	59,1 III
Vicia hirsuta	—	.	1	.	1	.	.	2	.	3	2	1	+	+	1	.	.	.	1	1	1	.	59,1 III
Vicia tetrasperma	.	.	2	.	.	2	—	.	.	1	+	+	+	+	.	.	.	.	1	.	1	.	45,5 III
Vicia angustifolia	—	.	+	+	.	+	—	1	.	.	.	.	.	.	.	1	.	.	+	.	1	.	40,9 III
Scleranthus annuus	2	1	.	.	2	1	2	.	.	.	.	.	.	.	.	.	1	.	.	1	2	1	40,9 III
Apera spica-venti	.	.	1	3	+	3	.	.	.	.	.	.	.	.	.	.	.	.	1	2	2	.	31,8 II
Myosotis arvensis	.	—	1	.	.	+	.	1	1	+	—	+	.	.	.	.	.	.	.	.	.	.	36,4 II
Anthemis arvensis	.	.	.	.	.	+	+	.	.	.	.	.	.	.	.	.	1	.	+	.	.	.	18,2 I
Rumex acetosella (dif.)	.	.	.	.	+	.	.	—	.	.	.	.	.	.	.	1	.	.	.	.	1	2	22,7 II
Arabidopsis thaliana (dif.)	—	.	.	.	1	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	+	.	18,2 I
Veronica arvensis	—	.	+	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	18,2 I
Veronica triphyllos	1	.	—	—	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	—	18,2 I

Tab. 3. (coutinned)

Association	*Consolido — Anthemidetum austriacae*																						
Subassociation	*trifolietosum arvensis*																						
Variant	typical									with *Gypsophila muralis*						with *Anthemis ruthenica*							
Relevé, no.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	constancy
Number of species	39	45	41	40	40	40	32	33	32	25	21	25	20	19	18	32	29	27	33	23	33	25	
Papaver argemone	+	.	1	.	.	.	.	—	.	.	.	.	.	.	.	.	.	.	.	1	.	.	18,2 I
Chamomilla recutita	.	.	2	.	—	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	9,1 I
Chenopodietalia and *Eragrostietalia* species:																							
Thlaspi arvense	+	.	2	1	1	+	.	+	—	—	.	—	.	.	.	.	+	2	+	.	—	.	59,1 III
Galinsoga parviflora	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	2	—	2	.	.	.	—	18,2 I
Oxalis fontana	.	.	.	.	.	.	.	.	.	2	1	1	.	.	.	.	.	.	.	.	1	.	18,2 I
Polygonum lapathifolium s.l.	.	.	.	.	—	.	+	.	.	.	.	.	.	.	.	.	.	.	1	.	.	1	18,2 I
Veronica polita	.	+	.	1	.	.	—	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	13,6 I
Lycopsis arvensis	.	.	.	.	.	1	—	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	13,6 I
Echinochloa crus-galli	.	.	.	.	.	.	—	.	.	.	.	.	.	.	.	.	.	2	1	.	.	.	13,6 I
Euphorbia helioscopia	.	.	.	1	1	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	13,6 I
Chaenorrhinum minus	.	+	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	9,1 I
Digitaria sanguinalis	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	1	.	9,1 I
Setaria glauca	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	1	.	1	.	13,6 I
Sisymbrietalia species:																							
Descurainia sophia	2	.	—	.	.	+	.	.	.	.	.	.	—	—	.	+	—	.	.	+	2	1	45,5 III
Bromus sterilis	.	.	.	.	.	.	.	.	.	.	.	.	+	+	.	.	.	.	.	.	—	.	13,6 I
Stellarietea species:																							
Viola arvensis	+	1	1	1	1	1	.	+	1	2	3	2	1	1	+	1	1	1	1	2	.	.	86,4 V
Fallopia convolvulus	+	1	1	2	1	1	2	1	2	.	.	.	+	—	1	2	2	1	2	2	.	2	81,8 V
Stellaria media	1	+	1	1	.	1	.	1	1	1	2	+	.	.	+	.	.	.	1	.	2	+	63,6 IV
Matricaria perforata (*Tripleurosp. inodorum*)	+	+	1	+	2	2	.	.	2	1	+	1	.	.	.	2	.	.	2	1	1	.	63,6 IV
Anagallis arvensis	+	2	1	2	1	+	1	—	1	.	.	.	.	.	+	.	1	.	1	.	.	+	59,1 III
Capsella bursa-pastoris	2	+	1	1	+	1	.	1	+	.	.	.	.	.	.	1	1	1	.	1	.	.	54,5 III
Erodium cicutarium	.	2	.	+	.	.	.	+	.	.	.	.	.	.	.	1	2	2	1	.	.	1	36,4 II
Sonchus oleraceus	.	1	—	.	.	.	.	.	.	—	.	+	.	.	.	+	.	.	.	.	.	.	22,7 II

Tab. 3. (continued)

Association	*Consolido — Anthemidetum austriacae*																						
Subassociation	*trifolietosum arvensis*																						
Variant	typical									with *Gypsophila muralis*						with *Anthemis ruthenica*							
Relevé, no.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	constancy
Number of species	39	45	41	40	40	40	32	33	32	25	21	25	20	19	18	32	29	27	33	23	33	25	% class
Sonchus asper	.	1	.	.	.	.	.	+	1	.	.	.	.	.	.	+	—	.	.	.	.	.	22,7 II
Geranium pusillum	—	.	.	.	.	2	.	.	.	.	.	.	.	.	.	1	.	1	.	.	.	—	22,7 II
Lamium amplexicaule	.	.	1	+	1	.	.	1	.	.	.	.	.	.	.	.	.	1	.	.	.	.	22,7 II
Veronica persica	.	.	.	1	.	.	1	—	.	.	.	.	.	.	.	1	.	.	.	.	.	.	18,2 I
Erysimum cheiranthoides	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	2	.	1	.	.	.	—	13,6 I
Atriplex patula	.	.	+	—	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	13,6 I
Lamium purpureum	.	+	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	9,1 I
Convolvulo-Chenopodiea species:																							
Chenopodium album	1	+	1	+	2	.	.	1	1	—	+	.	—	—	1	.	2	2	1	.	.	1	72,7 IV
Polygonum aviculare agg.	1	1	1	1	2	2	1	1	1	.	.	.	+	—	.	2	2	.	1	1	1	2	77,3 IV
Cirsium arvense	.	1	+	+	1	1	1	2	2	1	1	1	.	.	.	1	.	.	.	.	.	.	54,5 III
Elytrigia repens	1	.	.	.	2	1	.	2	.	+	1	+	.	.	.	1	1	1	.	1	1	.	54,5 III
Convolvulus arvensis	1	1	.	1	+	1	2	.	2	.	.	.	.	+	.	.	1	.	.	1	.	1	50 III
Melandrium album	—	.	.	—	.	.	.	1	.	+	1	+	.	.	.	+	—	.	.	+	.	.	40,9 III
Equisetum arvense	1	.	.	.	.	.	.	.	.	.	.	.	.	.	1	1	.	1	1	+	.	.	27,3 II
Plantago major subsp. *major*	+	.	.	.	1	.	.	.	.	+	+	+	.	.	.	.	.	.	.	.	.	—	27,3 II
Sonchus arvensis	.	.	.	+	+	.	.	1	2	.	.	.	.	.	+	.	.	.	.	.	.	.	22,7 II
Daucus carota	.	+	1	.	+	.	+	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	22,7 II
Cardaria draba	.	1	.	.	.	.	+	.	.	.	.	.	+	+	.	.	.	.	.	.	.	.	18,2 I
Artemisia vulgaris	.	+	—	.	.	.	.	.	.	.	.	.	+	.	+	.	.	.	.	.	.	.	18,2 I
Rumex crispus	.	.	.	.	.	.	.	.	+	—	.	—	.	.	.	.	.	.	+	.	.	.	18,2 I
Crepis virens	2	—	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	13,6 I
Poa annua	+	.	.	.	2	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	13,6 I
Linaria vulgaris	.	1	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	9,1 I
Rubus caesius	.	.	.	—	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	9,1 I
Lactuca serriola	.	.	1	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	9,1 I

Tab. 3. (continued)

Association	*Consolido — Anthemidetum austriacae*																						
Subassociation	*trifolietosum arvensis*																						
Variant	typical									with *Gypsophila muralis*						with *Anthemis ruthenica*							
Relevé, no.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	constancy
Number of species	39	45	41	40	40	40	32	33	32	25	21	25	20	19	18	32	29	27	33	23	33	25	% class
Molinio-Arrhenatheretea species:																							
Plantago lanceolata	.	—	.	.	1	.	—	.	.	.	.	.	.	.	.	.	—	.	.	.	+	.	22,7 II
Trifolium repens	.	.	.	.	.	.	.	.	.	+	1	1	+	.	+	.	.	.	.	.	.	.	22,7 II
Trifolium campestre	.	.	.	.	.	2	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	9,1 I
Taraxacum officinale	.	+	.	.	1	—	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	13,6 I
Achillea millefolium	1	.	—	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	9,1 I
Cerastium holosteoides	—	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	—	.	9,1 I
Isoëto-Nanojuncetea species:																							
Sagina procumbens	.	.	.	.	.	.	.	.	.	.	.	.	+	+	.	.	.	.	.	.	.	.	9,1 I
Plantago intermedia	.	1	.	—	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	9,1 I
Sedo-Scleranthetea species:																							
Filago arvensis	—	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	1	—	18,2 I
Vicia lathyroides	.	—	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	9,1 I
Festuco-Brometea species:																							
Arenaria serpyllifolia	2	+	.	2	+	1	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	27,3 II

Species recorded in one relevé only (pertinent nos. of the relevé in the brackets): *Agrostemma githago* — (3), *Anagallis foemina* 2 (2), *Anchusa officinalis* — (22), *Anthemis cotula* — (9), *Aphanes arvensis* + (4), *Arctium tomentosum* + (15), *Berteroa incana* — (21), *Bromus secalinus* + (14), *Chenopodium hybridum* + (18), *Chenopodium strictum* + (18), *Cichorium intybus* + (9), *Echium vulgare* — (8), *Falcaria vulgaris* — (9), *Fumaria officinalis* 1 (5), *Galeopsis tetrahit* — (3), *Galium aparine* 1 (6), *Lepidium campestre* + (22), *Matricaria suaveolens* 1 (6), *Misopates orontium* 2 (2), *Myosotis ramosissima* + (1), *Myosotis stricta* — (3), *Neslia paniculata* — (2), *Papaver dubium* + (6), *Plantago indica* — (22), *Poa compressa* 1 (5), *Polycnemum arvense* + (21), *Polygonum amphibium* 1 (18), *Polygonum persicaria* + (19), *Portulaca oleracea* 2 (18), *Potentilla anserina* — (7), *Ranunculus repens* + (21), *Sinapis alba* — (17), *Sisymbrium altissimum* 2 (21), *Solanum tuberosum* 1 (2), *Spergula arvensis* 2 (5), *Tussilago farfara* 2 (8), *Valerianella dentata* 1 (4), *Veronica hederifolia* subsp. *lucorum* — (3), *Vicia cracca* + (18).

Locations of the relevés in Table 3 (with the same sequence of data as in Tab. 1)

1 — 7166: ca 400 m E of the fishpond called Šakvický (SE of the village Šakvice), undulate ground, 180 m, June 3, 1964 (K)
2 — 5855: ca 1 km SW of the border of town Poříčany, slope ca 15°, aspect S, locally called "Vinice", 225 m, August 18, 1966 (K)
3 — 5953: ca 250 m WNW of the cross-roads near the village Hrnčíře, locally flat ground, 295 m, June 27, 1967 (K)
4 — 5655: ca 1.2 km NNE of the village Brodce (nowadays the highway Praha — Mladá Boleslav built over this locality), slope ca 7°, SW, 235 m, June 30, 1967 (K)
5 — 5950: ca 1 km SW of the church in the village Horní Podkozí, slope ca 7°, aspect SE, 395 m (to the E of the elevation point 397,5 m), July 2, 1968 (K)
6 — 5651: ca 1 km SW of the church in the village Černouček, locally flat ground, 245 m, July 11, 1972 (K)
7 — 5854: ca 1 km NW of the church in the village Mochov, locally flat ground, 205 m, August 9, 1972 (K)
8 — 5747: ca 0.8 km N of the church in the village Velká Černoc, locally flat ground till mild slope (SE aspect), 385 m, June 29, 1962 (K)
9 — 7878: ca 1.7 km WNW of the church in the village Čankov, locally flat till mild undulate ground, 190 m, July 21, 1973 (K)
10 — 7597: ca 300 m SW of the village Poľany, in the direction to the farm called Gutmanov dvorec, 100 m, July 15, 1980 (M)
11 — 7598: ca 200 m NE the village Poľany, at the left side of road to the village Leles, 102 m, July 15, 1980 (M)
12 — 7598: NE of the village Poľany, near the cross-road to Veľké Kapušany, at the left side of road, 100 m, July 15, 1980 (M)
13 — 7496: S of the village Sirník, near the cross-road to Novosad, at the right side of road to Brehov, 106 m, July 15, 1986 (M)
14 — 7496: ca 800 m S of the village Sirník, at the left side of road to the village Brehov, slope ca 15°, 108 m, July 15, 1986 (M)
15 — 7596: ca 400 m NE of the village Ladmovce, at the left side of road to the village Zemplín, 106 m, July 17, 1986 (M)
16 — 5957: ca 100 m of the E border of the town Kolín, at the right side of road to the village Tři Dvory, locally flat ground, 197 m, September 1, 1972 (K)
17 — 7163: ca 2 km NW of the village Valtrovice, near the fork of road to the village Strachovice, locally flat ground, 198 m, August 3, 1972 (K)
18 — 5856: ca 700 m S of the cross-road in the village Kostelní Lhota, at the left side of road to the small town Pečky, locally flat ground, 187 m, August 31, 1972 (K)
19 — 7668: ca 3 km NW of the centre of the village Pernek, locally flat ground, 205 m, July 26, 1973 (K)
20 — 7467: ca 2.5 km NW of the centre of the village Veľké Leváre, flat till slightly undulate ground, 152 m, June 26, 1974 (K)
21 — 7597: Plešany (Svätuše), ca 500 m E of the fork of local road to the village Vojka, mild slope, aspect NW, 115 m, June 29, 1974 (K)
22 — 7069: ca 0.5 km SE of the border of village Ratíškovice, flat ground, 205 m, August 2, 1972 (K)

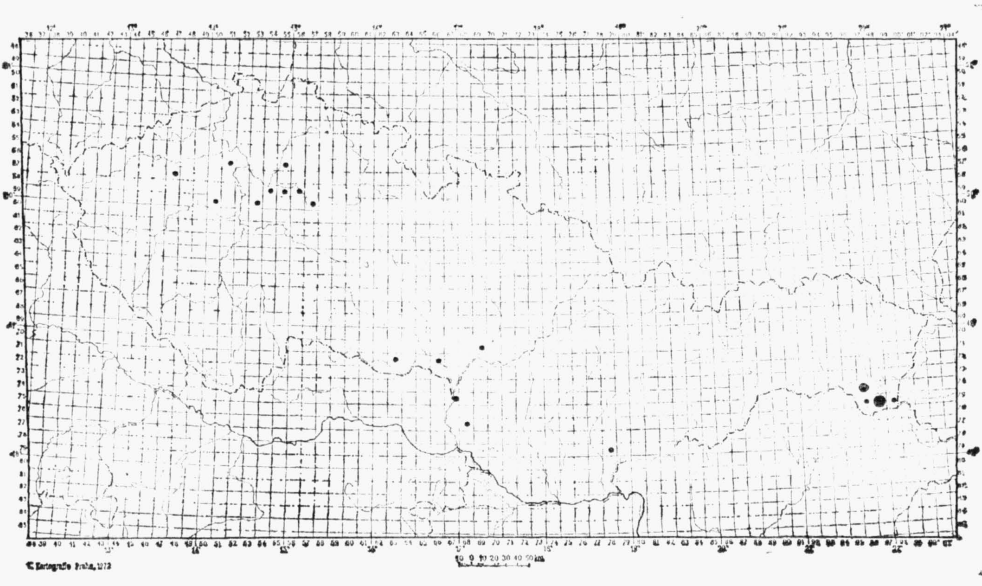

Fig. 2. Distribution of relevés of the *Consolido-Anthemidetum austriacae* subas. *trifolietosum arvensis* in Czechoslovakia; as to the symbols the same as in Fig. 1.

sandstones, conglomerates, slates, greywackes), on the other hand — prevalently — either of quaternary wind-blown sands, terrace sand and sands of other origin (mostly only slightly loamy) or of sandy gravel and gravel of terrace origin (also slightly loamy). The soil types are the brown forest soils of low base saturation (every time with a high admixture of gravel and stones), very often rhegosols or alluvial soils on light substrata. From the floristic viewpoint, the subassociation is characterized by a marked differential group of species, especially *Trifolium arvense* (as a significant species first of all for the class *Sedo-Scleranthetea*) characterizes always on arable soil the extreme habitats of light, carbonat-free soils. Even in this subassociation the representation of species is not equal, and for the present time at least three variants can be distinguished (see Table 3):

a) Typical variant — is represented by nine relevés prevalently from Bohemia and Moravia (only one relevé from Slovakia) from the years 1962—1973 and, analogously to the typical variant in the foregoing subassociation, it reflects the relatively diverse species composition of that time period; in total, it includes 109 taxa with the average number of 38 species per relevé. Also the relatively higher presence of species belonging to the alliance *Caucalidion* and to the order *Secalietalia* (possibly of the alliance *Sherardion*) in comparison with the other two variants is evident. Crops were especially winter wheat (or the stubbles after its harvest), less frequently winter rye, but also winter rape and exceptionally also summer crops (oats, horse bean).

b) Variant with *Gypsophila muralis* — is represented by six relevés from the Východoslovenská nížina Lowland taken in the years 1980—1986, and a considerable decrease of species diversity during this time is to be observed: in total, 43 taxa were found, the average number of species per

relevé amounted to 21.3. *Gypsophila muralis*, together with some other species of the class *Isoëto-Nanojuncetea* (e.g. *Sagina procumbens*), characterizes the alluvial soils on light substrata with the temporarily waterlogged soil profile. Also both vetch species (*Vicia grandiflora* and *V. pannonica*) complete the picture of the geographically conditioned occurrence of this variant. There is also evident decrease of the presence of species of the alliance *Caucalidion* and of the order *Secalietalia* (possibly also of the alliance *Sherardion*). The crop, from which these relevés were taken, was mainly winter rye.

c) Variant with *Anthemis ruthenica* — represents a quite peculiar community, in which this taxon also asserts itself on the arable soil, often even with a high dominance. Of the seven relevés taken during the years 1972—1974, six come exclusively from sandy soils (of the rhegosol type) at the lowest altitudes (152—205 m a.s.l.), predominantly on alluvial sediments of wind-blown sands in the lowlands along the middle course of the Labe (Elbe) river, in southern Moravia, in the Záhorie Lowland (SW Slovakia) and in the Východoslovenská nížina Lowland (in the environs of the town Kráľovský Chlmec). The species diversity lies between the preceding variants a and b — in total 82 taxa were found, the average number of species per relevé amounting to 28.9. Witn respect to the extreme habitat conditions, the species of the alliance *Caucalidion* assert themselves already to the minimum degree, and the species of the order *Secalietalia* (and/or of the alliance *Sherardion*) are also less frequently represented, whereas the species of the order *Aperetalia* are present to about the same degree as in variant a. The crop was first of all winter rye, than winter wheat and summer crops (oats, chicory).

Agricultural assessment of the association

The floristic composition does not represent any serious threat to plant production. On the basis of our observations and relevé materials, the association can be evaluated rather as a declining community. It corresponds well with the evaluation published before (Kropáč in Moravec et al. 1983), viz. that it is the community with decline caused by human activities, but sufficiently abundant. By further impoverishment of more sensitive species, above all of those belonging to the alliance *Caucalidion* and to the order *Secalietalia*, the colonization of vacant gaps by resistant species of higher syntaxa can be assumed. Of the diagnostically important species group, the following will appear as relatively resistant species: *Anthemis austriaca*, together with the taxomically related *Chamomilla recutita* (*Aperetalia*) and especially the troublesome weed *Matricaria perforata* (*Stellarietea mediae*), which from the viewpoint of weed control belongs to persistent species. Furthermore, it will be necessary to take into account some species of the division *Convolvulo-Chenopodiea*, which can also be locally overproduced in this association and become harmful weeds. They are first of all *Elytrigia repens*, *Cirsium arvense*, *Convolvulus arvensis* and *Chenopodium album*. Generally speaking, it appears as most probable that a convergence of the association with some related associations of both the alliance *Caucalidion* and of the alliance *Aphanion* and a gradual reduction into the specific poor communities with some dominants of the division *Convolvulo-Chenopodiea* will set in. Such communities then could be classified as derived communities in

the sense of the conception by KOPECKÝ et HEJNÝ (see also KROPÁČ 1988). With respect to soil conditions, especially to the gravel and stone content in the ploughed layer and often also to its rather shallow profile, it will be necessary to consider very carefully the balance of both chemical and non-chemical control measures (cf. KOHOUT 1987). In the habitats of this association *Elytrigia repens* can become a serious problem.

Phytosociological comparison with the related segetal communities

From the Pannonian floristic region a number of allied syntaxa have been described, in which especially *Anthemis austriaca* occurs in various combinations (above all with thermophilous segetals). Seemingly similar to our association by its name is *Anthemido (austriacae)-Consolidetum orientalis* SLAVNIĆ 1951 described from the Voivodina in Yugoslavia. Of course, it is a quite different syntaxon consisting of typical thermophilous species mostly of submediterran-subcontinental distribution (*Consolida orientalis, Turgenia latifolia, Caucalis platycarpos* subsp. *muricata, Bifora radians, Vaccaria hispanica, Adonis flammea, Myagrum perfoliatum, Bupleurum rotundifolium* — cf. orig. SLAVNIĆ 1951). This association is rather more related to the association *Caucalido (latifoliae)-Adonidetum flammeae* TX. 1950, described just before from the calcareous substrata of SW Germany. The existence of the association *Anthemido-Consolidetum orientalis* was later documented with some modifications in various nomenclatural versions (*Consolido orientalis-Vicietum striatae* SOÓ 1947 in TÜXEN 1950 from the Tisza river Lowland) or in the form of various local associations from Hungary (TIMÁR 1957, SOÓ 1964), Roumania (*Sinapio-Biforetum radiantis* (MORARIU 1943] SOÓ 1946 in TÜXEN 1950, *Anthemido austriacae-Vicietum striatae* SPIRIDON 1971), from Bulgaria (KOLEV 1963). In all cases the associations of warm lowland regions of southeastern Europe, markedly different from the association described by us, are involved.

In our case a comparison with the communities described from the Austrian Thermophyticum by HOLZNER (1970, 1973, 1974) is most significant. From northern Burgenland (Austria) he described association *Camelinetum microcarpae* HOLZNER 1970, which was later by the same author amended for a wider region in the form *Anthemido austriacae-Camelinetum microcarpae* HOLZNER 1973. This association is also characterized by the presence of numerous elements of the alliance *Caucalidion* (i.a. *Caucalis platycarpos, Galium tricornutum, Euphorbia falcata, Bupleurum rotundifolium, Nigella arvensis*, etc.). The subassociation *melampyretosum* (1970) or *sisymbrietosum* (1973) is characterized especially by taxa of extreme habitats (in Burgenland on limestones *Melampyrum arvense* and *M. barbatum*, in Lower Austria *Sisymbrium orientale* and even *Iberis pinnata* and *Consolida orientalis*). The autonymous subassociation „*camelinetosum*" (HOLZNER 1973) as "typical" occupies the intermediate position, as regards the ecological and floristic viewpoints. These communities differ markedly from the association described by us.

For the purpose of our comparison, the subassociation *scleranthetosum* HOLZNER 1973 is decisive (see Table 4, column 4, synthetic data made on the basis of 16 relevés from the original table in HOLZNER 1973, appendix). This

Tab. 4. — Comparison of allied communities

		Anthemido ruthenicae-Sperguletum arvensis	*Consolido-Anthemidetum austriacae* subas. *trifolietosum arvensis*	*Consolido-Anthemidetum austriacae* subas. *anthemidetosum*	*Anthemido austriacae-Camelinetum microcarpae* subas. *scleranthetosum*	*Euphorbio exiguae-Melandrietum noctiflori*	*Aphano-Matricarietum*
Syntaxon, no.		1	2	3	4	5	6
Number of relevés		14	22	16	16	43	43
	Consolida regalis	IV	V	V	V	III	I
	Anthemis austriaca	IV	IV	V	III	r	r
	Centaurea cyanus	V	IV	IV	III	I	IV
I	*Anthemis ruthenica*	V	II	.	.	.	.
	Spergula arvensis	IV	r	.	.	r	I
	Herniaria hirsuta	III	.	.	r	.	.
	Spergularia rubra	II	.	.	.	.	I
	Vicia lathyroides	I	I	.	.	.	.
	Filago vulgaris (*F. germanica*)	II	.	.	.	.	.
	Filago minima	I	.	.	.	.	.
II	*Trifolium arvense*	II	V	.	II	.	.
	Conyza canadensis	I	III	.	I	I	r
	Setaria viridis	II	II	.	.	I	r
	Setaria pumila (*S. glauca*)	II	I	.	r	r	.
	Filago arvensis	I	I	.	III	.	.
	Digitaria ischaemum	r	II	.	.	.	.
	Digitaria sanguinalis	r	I	.	.	.	.
III	*Plantago major* subsp. *intermedia*	II	I	r	.	II	II
	Gypsophila muralis	II	II	.	.	.	.
	Filaginella uliginosa (*Gnaphalium uliginosum*)	I	.	.	.	r	II
	Juncus bufonius	I	.	.	.	.	II
IV	*Arabidopsis thaliana*	III	I	I	II	r	II
	Veronica hederifolia subsp. *hederifolia* et *lucorum*	III	r	I	II	r	r
	Veronica triphyllos	IV	I	.	III	r	I
	Myosotis stricta	IV	r	.	I	.	I
	Holosteum umbellatum	III	.	r	I	.	.
	Erophila verna	III	.	.	I	.	.
	Valerianella locusta	II	.	.	I	.	.
	Ornithogallum umbellatum	I	.	.	.	.	.
	Veronica triloba	.	.	.	II	.	.
	Veronica praecox	.	.	.	I	.	.
A	*Melandrium noctiflorum*	.	II	III	II	V	r
	Euphorbia exigua	.	I	I	II	IV	r

Tab. 4. (continued)

		Anthemido ruthenicae-Spergularietum arvensis	*Consolido-Anthemidetum austriacae* subas. *trifolietosum arvensis*	*Consolido-Anthemidetum austriacae* subas. *anthemidetosum*	*Anthemido austriacae-Camelinetum microcarpae* subas. *scleranthetosum*	*Euphorbio exiguae-Melandrietum noctiflori*	*Aphano-Matricarietum*
	Lathyrus tuberosus	.	I	r	I	III	.
	Camelina microcarpa	.	I	.	III	r	.
	Stachys annua	.	I	r	II	.	.
	Anagallis foemina	.	r	.	II	r	.
	Caucalis platycarpos	.	.	.	II	r	.
	Fumaria vaillantii	.	.	.	I	r	.
	Euphorbia falcata	.	.	.	II	.	.
	Adonis aestivalis	.	.	.	I	.	.
	Galium tricornutum	.	.	.	I	.	.
	Nigella arvensis	.	.	.	I	.	.
	Bifora radians	.	.	.	I	.	.
	Consolida orientalis	.	.	r	.	.	.
	Kickxia spuria	.	.	.	r	.	.
	Kickxia elatine	.	.	.	r	.	.
B	*Papaver rhoeas*	II	III	III	IV	III	II
	Sinapis arvensis	.	II	II	II	IV	I
	Vicia villosa subsp. *varia* (*V. dasycarpa*)	r	II	r	I	r	I
	Medicago lupulina	.	IV	I	II	IV	I
	Sherardia arvensis	III	I	.	II	IV	I
	Avena fatua	.	I	II	II	IV	II
	Buglossoides arvensis	II	I	II	II	r	II
	Galium spurium	II	I	I	III	r	.
	Neslia paniculata	.	r	I	II	II	I
	Aethusa cynapium subsp. *agrestis*	.	I	I	I	III	r
	Campanula rapunculoides	.	I	r	I	III	I
	Ranunculus arvensis	r	I	I	.	r	I
	Valerianella dentata	.	r	.	I	I	II
	Agrostemma githago	II	r	.	r	.	r
	Vicia grandiflora subsp. *sordida*	III	I	II	.	.	.
	Misopates orontium	r	r	.	I	.	.
	Legousia speculum-veneris	.	.	.	I	.	.
C	*Scleranthus annuus*	V	III	I	V	II	IV
	Raphanus raphanistrum	IV	III	III	II	III	V
	Vicia hirsuta	III	III	III	I	I	IV
	Vicia tetrasperma	r	III	III	.	II	IV
	Veronica arvensis	IV	I	.	I	I	IV
	Myosotis arvensis	I	II	II	II	III	V
	Apera spica-venti	II	II	II	r	I	V
	Aphanes arvensis	IV	r	.	r	r	V
	Vicia angustifolia	.	III	r	II	III	IV
	Anthemis arvensis	II	I	.	II	r	III
	Rumex acetosella	II	II	r	I	r	II

Tab. 4. (continued)

		Anthemido ruthenicae-Sperguletum arvensis	*Consolido-Anthemidetum austriacae* subas. *trifolietosum arvensis*	*Consolido-Anthemidetum austriacae* subas. *anthemidetosum*	*Anthemido austriacae-Camelinetum microcarpae* subas. *scleranthetosum*	*Euphorbio exiguae-Melandrietum noctiflori*	*Aphano-Matricarietum*
	Chamomilla recutita	.	I	III	.	r	III
	Papaver argemone	I	I	II	.	r	I
D	*Thlaspi arvense*	.	III	IV	III	IV	IV
	Euphorbia helioscopia	I	I	I	r	IV	r
	Veronica polita	I	I	I	III	III	r
	Lycopsis arvensis	II	I	r	r	r	.
	Polygonum lapathifolium s.l.	I	I	II	.	II	I
	Polygonum persicaria	r	r	I	r	II	II
	Oxalis fontana	II	I	I	.	r	r
E	*Viola arvensis*	V	V	V	V	V	V
	Stellaria media	III	IV	V	I	V	V
	Fallopia convolvulus	II	V	V	II	V	V
	Matricaria perforata (*Tripleurospermum inodorum*)	IV	IV	IV	III	III	IV
	Anagallis arvensis	II	III	III	IV	V	IV
	Capsella bursa-pastoris	r	III	III	I	III	IV
	Veronica persica	III	I	II	II	IV	III
	Lamium amplexicaule	IV	II	III	II	III	III
	Descurainia sophia	.	III	III	I	I	r
	Lamium purpureum	I	I	II	.	II	II
F	*Chenopodium album*	II	IV	V	II	IV	II
	Convolvulus arvensis	r	III	IV	II	V	III
	Cirsium arvense	r	III	III	II	V	IV
	Polygonum aviculare agg.	II	IV	III	III	V	III
	Elytrigia repens	II	III	III	I	IV	III
	Galium aparine	III	r	II	II	III	III
	Equisetum arvense	II	II	r	r	I	II
	Cardaria draba	.	I	.	II	r	.

association, as its author reports, colonizes acid soils of the Thermophyticum (especially the territories "Parndorfer Platte" and "Marchfeld"), and is characterized, besides the species of the ecologic-sociological group "*Scleranthus annuus*" (in the author's conception), also by the "thermophilous acidophytes" as *Herniaria hirsuta*, *Filago arvensis* and *Misopates orontium* (HOLZNER 1973: 43). With a lower constancy, however, in this subassociation even the taxa of the alliance *Caucalidion* occur, which, beyond the Pannonian region, are exclusively limited to calcareous soils (*Euphorbia falcata*, *Galium tricornutum*, *Bifora radians*, *Kickxia spuria*); in the Austrian Pannonicum, however, they grow on both limestone and silicate substrata (HOLZNER 1973 : 46). In our opinion this important fact of regional character may be the reason why the relatively allied subassociation (*Anthemido austriacae-*

Camelinetum microcarpae subas. *scleranthetosum*) is to be regarded as different from our association described here. In the territory of Czechoslovakia it is first of all *Anthemis austriaca* (possibly with some other species of the alliance *Caucalidion*), which in the Thermophyticum also passes over to the silicate substrata and even has its ecological optimum here.

From the comparative Table 4, a rather close relation between two subassociations (our syntaxon no. 2 and HOLZNER's syntaxon no. 4) becomes evident, and at the same time the differences are also distinct (syntaxon no. 2 is substantially poorer in basiphilous species). Furthermore, important for our material is the comparison with the association *Anthemido ruthenicae-Sperguletum arvensis* HOLZNER 1974 described from the acid soils on the poor sands of central Burgenland ("Oberpullendorfer Becken") — see Table 4, column 1, synthesis of 14 relevés from the original publication (HOLZNER 1974, Table). It is a peculiar association characterized by the presence of the species combination of group I, which in the other syntaxa under comparison is only negligibly represented. The total absence of species belonging to the alliance *Caucalidion* (group A, Table 4) and the slighter presence of species of the order *Secalietalia* is also characteristic. The author has left open the question of classification into higher syntaxa, but it is clear that the association belongs to the order *Aperetalia* (probably alliance *Aphanion*). Some elements of this association are to be seen in our syntaxon no. 2 (above all in the variant with *Anthemis ruthenica*).

Remaining to be dealt with is the relation of *Consolido* (*regalis*)-*Anthemidetum austriacae*, divided into two subassociations (syntaxa no. 2 and 3, Table 4), to the rather commonly distributed association of the alliance *Caucalidion* with relatively wide ecological amplitude (syntaxon no. 5, Table 4) and to the association of "nutrient rather rich soils" of the alliance *Aphanion* (syntaxon no. 6, Table 4). The synthesis has been made from the selected material (KROPÁČ, ms.). Comparing the new association with syntaxon no. 5 (*Euphorbio-Melandrietum*) a low constancy of *Anthemis austriaca* and *Centaurea cyanus* and, on the contrary, a higher constancy of some taxa of the alliance *Caucalidion* (A) and the order *Secalietalia* (B) becomes evident in the syntaxon no. 5. The *Aphano-Matricarietum* (syntaxon no. 6), in contradistinction to it, differs not only by the low constancy of *Anthemis austriaca*, but also by a high constancy of *Centaurea cyanus* as well as of other species of the order *Aperetalia* (C) and, naturally, by the almost total absence of the species belonging to the alliance *Caucalidion* (A) and by the lower constancy of the order *Secalietalia* (B).

The higher constancy of group IV (ephemerophytes of predominantly winter forms) is conspicuous in HOLZNER's syntaxa nos. 1 and 4. It is explainable by the consequent application of the principles of agroecophases (KROPÁČ et al. 1971) in our materials, although HOLZNER (1973) agrees in the main with our approach. His *Anthemido austriacae-Camelinetum microcarpae* is the so-called summer association ("Aestivalassoziation"), which replaces in the same site the spring association ("Vernalassoziation") *Veronico trilobae-Veronicetum triphylli* SLAVNIĆ 1951 emend. HOLZNER 1973.

SOUHRN

Nová asociace pro území ČSSR, publikovaná již dříve jako „nomen nudum" (KROPÁČ 1981), je řazena do svazu *Caucalidion lappulae* R. TX. 1950, řádu *Secalietalia* BR.-BL. et al. 1936, třídy

Stellarietea mediae R. Tx., Lohm. et Preising 1950 a jako střešního syntaxonu je užito oddělení *Convolvulo-Chenopodiea* Krippelová 1978.

Fytocenologicky je nová asociace charakterizována indikační druhovou skupinou: *Anthemis austriaca*, *Consolida regalis* a *Centaurea cyanus* (nomenklatura idiotaxonů podle publikace Neuhäuslová et Kolbek 1982). Kromě příslušných vyšších syntaxonů je charakteristický vyšší podíl druhů řádu *Aperetalia* J. et R. Tx. in Malato-Beliz et al. 1960, což demonstruje postavení asociace na acidoklinním křídle svazu *Caucalidion*. Je uvedena synmorfologie a zastoupení životních forem v asociaci (terofyty tvoří ca. 80 %, hemikryptofyty ca. 16 % a geofyty ca. 5 %).

Synchorologická charakteristika v ČSSR ukazuje na rozšíření v klimatické oblasti teplé až mírně teplé, v okrscích relativně suchých, ve stupních planárním až kolinním (optimální výškové rozmezí je mezi 100 až 400 m.n.m.). Plošným výskytem je asociace vázána především na hnědé půdy (typologie podle komplexního průzkumu zemědělských půd ČSSR) mezo- až oligobázické (písčitohlinité až písčité, zpravidla silně štěrkovité a kamenité) a regosoly (na píscích různého původu), v menší míře na jiné půdní typy (degradované až illimerizované černozemě, nivní půdy na lehčích substrátech, často v různé míře oglejené, apod.). Zemědělsky se jedná převážně o výrobní subtyp řepařsko-žitný. Prostorově navazuje asociace zpravidla na některé nižší syntaxony asociací *Euphorbio exiguae-Melandrietum noctiflori* G. Müller 1964 nebo *Lathyro tuberosi-Adonidetum aestivalis* Kropáč et Hadač in Kropáč at al. 1971 (směrem k bazičtějším stanovištím) či *Aphano-Matricarietum* Tx. 1937 (směrem ke chladnějším polohám hlinitých půd). Časově je vázána na jarně-letní agrocykofáze s obilninami (sensu Kropáč et al. 1971) a symfenologického optima dosahuje v měsících červen až červenec.

Podrobně je uvedena fytocenologická variabilita asociace, zejména z hledisek ekologických, geografických a vlivem hospodaření na orné půdě. Je uvedeno členění do dvou subasociací a v obou subasociacích do tří variant (viz tab. 1 až 3). Nominátní subasociace (subas. *anthemidetosum*) je floristicky negativně charakterizována diferenciální skupinou druhů další subasociace a osídluje převážně středně těžké až lehčí půdy. Typická varianta je floristicky relativně bohatší a její dokumentace pochází z období nedávno minulého z Čech, varianta s *Vicia grandiflora* a *V. pannonica* je z Východoslovenské nížiny ze současného období (a druhově je méně pestrá) a varianta ochuzená, rovněž z Východoslovenské nížiny, dokumentuje současný trend ubývání citlivějších segetálních druhů. Subasociace *trifolietosum arvensis* je floristicky odlišena výraznou diferenciální skupinou druhů (viz tab. 3), které charakterizují na orné půdě extrémní stanoviště lehkých bezkarbonátových půd. Typická varianta je opět floristicky relativně bohatší a je doložena z Čech z období nedávno minulého. Varianta s *Gypsophila muralis*, floristicky chudší, je ze současného období z Východoslovenské nížiny. Extrémní křídlo představuje varianta s *Anthemis ruthenica*, jsou to společenstva výlučně lehkých půd (obvykle písků) termofytika Čech, Moravy i východního Slovenska.

Závěrem je uvedeno zemědělské zhodnocení asociace: představuje spíše ustupující společenstvo, dosud ještě hojné, poukazuje se ovšem na možnosti přemnožení některých plevelných druhů, zejména dominant vyšších syntaxonů.

Konečně v poměrně rozsáhlém tabelárním srovnání příbuzných segetálních společenstev (tab. 4) s příslušným diskusním rozborem jsou analyzovány vztahy k dosud popsaným syntaxonům a je uvedena argumentace pro vyčlenění nově publikované asociace.

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