

## Syntaxonomy of segetal communities of Slovakia

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ABSTRACT: In the paper, there is given syntaxonomical classification of segetal communities of the Slovakia. In the Slovakia 22 segetal communities have been described. Two plant communities became extinct, five communities are endanger and eighteen exist continually.

KEYWORDS: segetal communities, phytocoenology, endanger communities, history of segetal vegetation, Slovakia

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### Introduction

The results of synthetic processing of 895 relevés of segetal vegetation of the region of Slovakia (Fig. 1) epitomize a complex of phytosociological units of 20 associations which have been registered during the last 25 years. When analyzing 58 syntaxa of various communities abreast associations and communities, which were used to global analyses, there differences arose in quantity and diversity of communities in compare with the summary of the weed communities (KRIPPELOVÁ 1984). We have not found out communities in Slovakia mentioned by KROPÁČ (1974), *Kickxio spuriae-Euphorbietum falcatae*, *Holco-Galeopsietum*, PASSARGE & JURKO ( 1975 ), *Trifolio-Scleranthetum*, *Viola tricoloris-Scleranthetum*, *Galeopsio-Sperguletum arvensis*, *Galeopsio-Chenopodietum polyspermi*, KRIPPELOVÁ (1981), *Lamio amplexicauli-Thlaspietum arvensis* and the occurrence of *Digitarietum ischaemii* mentioned by MOCHNACKÝ (1982), has not been confirmed.

## The history of segetal vegetation research in Slovakia

The beginning of the segetal vegetation research in Slovakia can be dated back to the time after the World War II. In that time authors published their results and characteristics of segetal species and their communities. This question was studied by OPLUŠTILOVÁ (1948, 1953), OSVAČILOVÁ (1955), KRIPPELOVÁ & KRIPPEL (1955), ZÁHRADNÍKOVÁ-ROŠETZKA (1955), DEYL (1956), RÁCZ (1955, 1956, 1959, 1962), OSVAČILOVÁ & SVOBODOVÁ (1961), JURKO (1964), HAJDÚK (1966), HILBERT (1968) and NEUHÄUSLOVÁ-NOVOTNÁ (1968). Since 1969 the segetal vegetation research has begun to develop systematically in the Department of Geobotany in the Institute of Botany, the Slovak Academy of Sciences and also through the Slovak Botanical Society at the Slovak Academy of Sciences – the section for synanthropic flora and vegetation.

In the Czech Republic, the research was concentrated in the Institute of Botany, the Czechoslovak Academy of Sciences, at the separate Department of anthropophytes. The results referring to segetal vegetation obtained from the territory of Slovakia were published by KROPÁČ (1974, 1981), KROPÁČ & HEJNÝ (1975).

In the time of the 70<sup>th</sup>, state (Czechoslovak) symposia “Synanthropic flora and vegetation” with an international participation (5 symposia up to now) played an important role in the synanthropic flora and vegetation research. Contributions from each symposium were published in the Proceedings (MAGIC (ed.), 1971, KRIPPELOVÁ (ed.), 1978, MUCINA, KRIPPELOVÁ, ZALIBEROVÁ & KLOTZ (eds.), 1984, ZALIBEROVÁ & al., 1988). ELIÁŠ (1974, 1980, 1981, 1982) mentioned segetal communities from Žitavská pahorkatina hilly country and Podunajská rovina lowland. PASSARGE & JURKO (1975) published the occurrence of segetal communities from the regions of northern Slovakia.

KRIPPELOVÁ (1981) and STANO (1980a) published information on segetal communities from Košická kotlina basin. KRIPPELOVÁ (1984) gave a survey of the segetal community research in Slovakia till 1983. MOCHNACKÝ (1982, 1983, 1984a, 1984b, 1984c, 1985a, 1985b, 1986a, 1986b, 1987, 1988, 1989, 1996a, 1996b, 1996c, 1997, 1999a, 1999b) informed of segetal communities from Východoslovenská rovina lowland. Segetal communities in the surroundings of the village Hybe were elaborated by STANO (1980b), those in Silická planina karst by TONČIKOVÁ (1980), and those in vineyards in Malé Karpaty Mts. by VILČEKOVÁ (1981).

## Methods

About 1300 phytocoenological relevés were the basis for receiving the survey of synanthropic vegetation. More than half of them have not been published. The relevés and their syntheses were made in accordance with the principles of Zürich-Montpellier school (BRAUN-BLANQUET 1964; WESTHOFF & VAN DER MAAREL 1978). The 7-grade scale (BRAUN-BLANQUET 1964) or modified 9-grade scale (BARKMAN & al. 1964), occasionally the 10-grade scale (DAHL & HADAČ 1941) were used for the registration of coverage and abundance. All the records

were transformed to the ordinary scale (MAAREL 1970) and with an original nomenclature stored in a database. The nomenclature was then unified following NEUHÄUSLOVÁ & KOLBEK (1982); exceptions are given with respect to the Checklist of Slovak flora (Marhold & Hindák 1998). The programmes TWINSpan (HILL 1979) and SYN-TAX IV (PODANY 1990) were used for a syntaxonomical revision for the first recognition of material. The programme FYTOPACK (JAROLÍMEK & SCHLOSSER 1997) was used for the unifying of taxa names and for the arranging of phytocoenological tables of relevés and synoptic tables. The syntaxonomic revision of the material from Slovakia was made on the level of associations and communities, of related groups or problematic associations and communities and also in the alliance and order level. From the results of numerical classification and ordinary techniques, from field and information from literature were arranged the tables of relevés and synoptic tables, which were the basis for the description of the syntaxa. In their headings in addition to the order number of a community also the number of relevés was used for the synthesis and the average number of species in the community. There are frequency values (in %) at each taxon in the columns. They are followed by the index expressing the average cover value of the taxa in a scale 1-9. The list of localities, respectively the one of the used sources of the phytocoenological relevés and an appendix are the part of each table. From the formal point of view, the structure of the unit characteristics corresponds in principle with that given by VALACHOVIČ & al (1995). The correct name of the syntaxon in accordance with the Code of phytocoenological nomenclature (BARKMAN & al. 1964) is followed by the relevant synonymics and reference to the table. The diagnostic group of taxa is usually divided to characteristic, differential and constantly accompanying taxa. Exclusive, selective and preferential taxa are included in the characteristic taxa (WESTHOFF & MAAREL 1978). Unless it is stated otherwise, the differential taxa differentiate the described syntaxon within the nearest superior syntaxon. The constantly accompanying taxa include standardly all the taxa belonging to the classes of constancy 4 and 5 (with the frequency of their occurrence in the given syntaxon above 60%). In the case of units poorer in species or of innerly more heterogenous units, we mention also the species in the class of constancy 3, only exceptionally those with the frequency of their occurrence under 50 %. The own communities descriptions are usually divided into the parts devoted to synmorphology, symphenology, syndynamics, synecology, syntaxonomy and synchorology. The distribution of the community is given in the level of orographical units in accordance with the map published for the needs of Slovak fauna databanks in the year 1983. If it is necessary, the description is supplemented by a note about the rareness and endangerness of the community, about the occurrence of more rare taxa, respectively of quarantin species. The categorizing of rare and endangered taxa follows from the publication MAGLOCKÝ & FERÁKOVÁ (1993) and that of quarantin weeds from the publication HEJNÝ & al. (1973).

## The list of used abbreviations

|   |  |
|---|--|
| ass. - association                                    | opt. - optimum                             |
| C - characteristic taxon (in tables)                  | p. p. - pro parte, in parts                |
| D - differential taxon (in tables)                    | prov. - provisional name                   |
| dif. - differential taxon                             | (R) - rare                                 |
| dom. - dominant species                               | reg. - regional                            |
| DST - diagnostic group of taxa                        | SC - synchorology                          |
| (E) - endangered, species endangered<br>by extinction | SD - syndynamics                           |
| (Ed) - endemic, endemic taxon                         | SE - synecology                            |
| em. - emendavit                                       | SF - symphenology                          |
| (I) - indeterminate, potentially<br>endangered taxon  | s. l. - sensu lato, in a wide sense        |
| ined. - inedit, unpublished                           | SM - synmorphology                         |
| in litt. - in litterae, written announcement          | spp. - more species of given genus         |
| KFN - the code of phytocoenological<br>nomenclature   | s. str. - sensu stricto, in a narrow sense |
| loc. - local  | ST - syntaxonomy                           |
| msc. - manuscript                                     | subas. - subassociation                    |
| n. n. - nomen nudum                                   | subsp. - subspecies                        |
|   | syn. - synonym                             |
|   | syntax. syn. - syntaxonomic synonym        |

## List of segetal communities in Slovakia

***Stellarietea mediae*** R. TX., LOHMEYER & PREISING in R. TX. ex VON ROCHOW 1951

***Violenea arvensis*** HÜPPE & HOFMEISTER ex JAROLÍMEK & al. 1997

***Centaureetalia cyani*** R. TX., LOHMEYER & PREISING in R. TX. ex VON ROCHOW 1951

***Caucalidion lappulae*** (R. TX. 1950) VON ROCHOW 1951

1. *Rhinantho-Avenetum fatuae* PASSARGE in PASSARGE & JURKO 1975
2. *Lathyro-Avenetum fatuae* PASSARGE in PASSARGE & JURKO 1975
3. *Lathyro tuberosi-Adonidetum aestivalis* KROPÁČ & HADAČ in KROPÁČ & al. 1971
4. *Consolido-Anthemidetum austriacae* KROPÁČ & MOCHNACKÝ 1990
5. *Euphorbio exigue-Melandrietum noctiflori* G. MÜLLER 1964

***Sherardion*** KROPÁČ & HEJNÝ in KROPÁČ 1978

6. *Misopateto-Galeopsietum ladani* HEJNÝ in KROPÁČ & HEJNÝ 1975
7. *Consolido regalis-Misopatetum* KROPÁČ in KROPÁČ & HEJNÝ 1975

***Veronico-Euphorbion*** SISSINGH ex PASSARGE 1964

8. *Euphorbio helioscopiae-Veronicetum persicae* PASSARGE in PASSARGE & JURKO 1975 em. JAROLÍMEK & al. 1997
9. *Setario viridis-Veronicetum politae* OBERD. 1957
10. *Veronicetum trilobae-triphyllidi* SLAVNIČ 1951

**Atriplici-Chenopodietalia albi** R. TX. (1937) NORDHAGEN 1940

**Scleranthion annui** (KRUSEMAN & VIEGER 1939) SISSINGH in WESTHOFF & al. 1946

11. *Spergulo arvensis-Scleranthetum annui* KUHN 1937

12. *Myosotido-Sonchetum arvensis* PASSARGE in PASSARGE & JURKO 1975

13. *Aphano arvensis-Matricarietum chamomillae* R. TX. 1937

14. *Cannabio ruderalis-Silenetum noctiflorae* SCHUBERT & al. 1981

15. *Erophilo-Arabidopsietum* KROPÁČ in KRIPPELOVÁ 1981

**Spergulo-Oxalidion** GÖRS in OBERD. & al. 1967

16. *Panico-Chenopodietum polyspermi* R. TX. 1937

**Panico-Setarion** SISSINGH in WESTHOFF & al. 1946

17. *Echinochloo-Setarietum pumilae* FELFÖLDY 1942 corr. MUCINA 1993

18. *Stachyo annui-Setarietum pumilae* FELFÖLDY 1942 corr. MUCINA 1993

**Eragrostietalia** J. TX. ex POLI 1966

**Eragrostion** R. TX. ex OBERDORFER 1954

19. *Hibisco-Eragrostietum* SOÓ & TIMÁR 1957

20. *Portulacetum oleraceae* FELFÖLDY 1942

## **Stellarietea mediae** R. TX., LOHMEYER & PREISING in R.TX. ex VON ROCHOW 1951

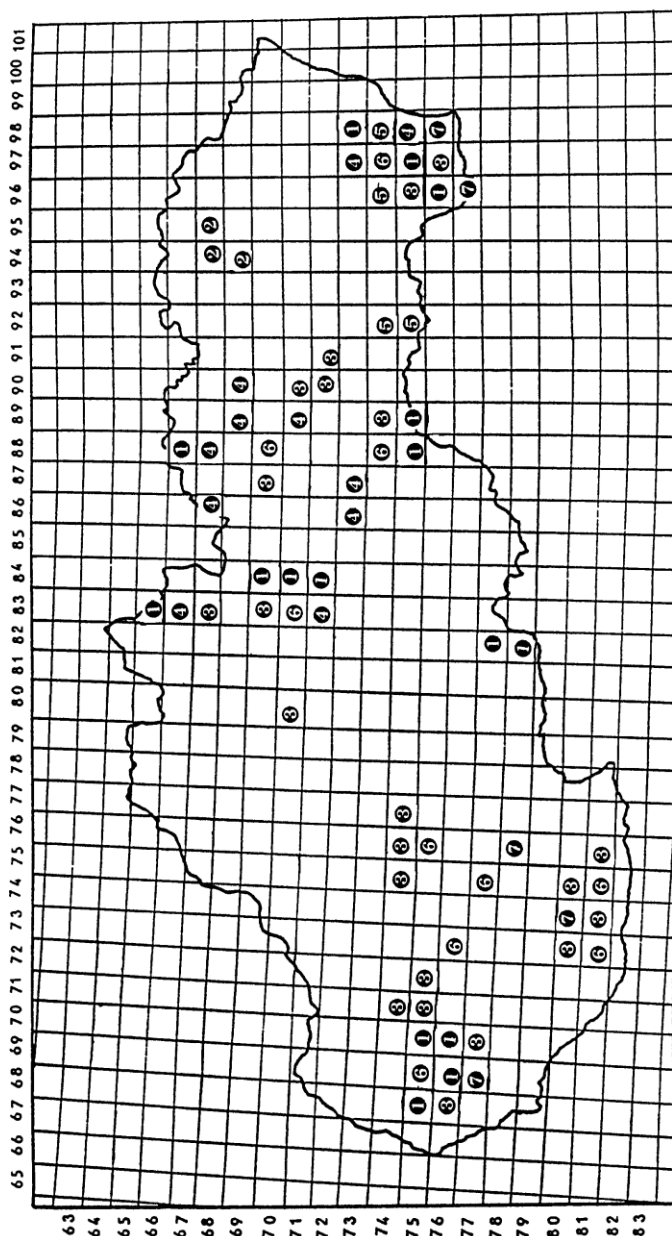
Therophyte communities on tilled soils and in fresh disturbed ruderal sites.

**Syn.:** *Chenopodietea* BR.-BL. 1951 (article 8), *Secalietea* BR.-BL. 1951 (articles 3f, 8), *Secalietea* BR.-BL. in BR.-BL. & al. 1952 (article 3f), „Rudereto-Secalinetea” BR.-BL. & al. 1936 (article 3f), *Thero-Chenopodietea* T. MÜLLER 1963 (article 8), *Onopordo-Sisymbrietea* GÖRS 1966 p.p. (article 3b), *Thero-Chenopodietea* LOHMEYER, J.TX. & R. TX. 1966 (article 29), *Onopordeto-Sisymbrietea* GRÜLL 1971 p.p. (article 3b), *Polygono-Chenopodietea* ELIÁŠ 1986 (article 29).

**Syntax.syn.:** *Chenopodietea* BR.-BL. in BR.-BL. & al. 1952, *Sisymbrietea* GUTTE & HILBIG 1975.

**Table 1**, columns 1-20

**Characteristic taxa:** *Amaranthus powellii*, *A. retroflexus*, *A. lividus*, *Anagallis arvensis*, *Anthemis arvensis*, *Atriplex patula*, *Bromus arvensis*, *B. secalinus*, *Capsella bursa-pastoris*, *Chenopodium album*, *Conyza canadensis*, *Euphorbia helioscopia*, *E. peplus*, *Fallopia convolvulus*, *Fumaria officinalis*, *Galeopsis bifida*, *G. tetrahit*, *Galinsoga parviflora*, *Geranium pusillum*, *Lamium amplexicaule*, *L. purpureum*, *Matricaria recutita*, *Mercurialis annua*, *Myosotis arvensis*, *Papaver rhoeas*, *Persicaria\* lapathifolia*, *P. maculata*, *Senecio vulgaris*, *Setaria pumila*, *S. viridis*, *Sinapis arvensis*, *Solanum nigrum*, *Sonchus arvensis*, *S. asper*, *S. oleraceus*, *Stellaria media*, *Thlaspi arvense*, *Tripleurospermum perforatum*, *Urtica urens*, *Veronica hederifolia*, *V. persica*, *Viola arvensis*.



**Fig. 1. Distribution of the segetal communities in Slovakia.**

1. *Caucalidion lappulae*. – 2. *Sherardion*. – 3. *Veronico-Euphorbion*. – 4. *Scleranthion annui*. – 5. *Spergulo-Oxalidion*. – 6. *Panico-Setarion*. – 7. *Eragrostion*.

**Table 1. Synoptic table of the class *Stellarietea mediae*.**

The numbers of the column correspond to the order numbers of the communities in the syntaxonomical survey given at the List of segetal communities of Slovakia above.  
Cc – *Centaureetalia cyani*, AC – *Atriplici-Chenopodietalia albi*, E – *Eragrostietalia*

| Syntaxon                                     |    | Cc         | AC       | E  |
|--|----|------------|----------|----|
| Columns                                      |    | 1234567891 | 11111111 | 12 |
|  |    | 0          | 12345678 | 90 |
| <b><i>Centaureetalia cyani</i></b>           |    |            |          |    |
| <i>Avena fatua</i>                           | C  | 552.1.321. | 11...11. | .. |
| <i>Aethusa cynapium</i>                      | C  | 112.1431.. | 1....111 | .. |
| <i>Sherardia arvensis</i>                    | C  | 242.15211. | 2....111 | .. |
| <i>Neslia paniculata</i>                     | C  | 211.1.111. | 1.....   | .. |
| <i>Euphorbia exigua</i>                      | C  | ..1.344.1. | .....1.  | .. |
| <i>Misopates orontium</i>                    | C  | ....155.1. | .....111 | .. |
| <i>Kickxia elatine</i>                       | C  | ..11.55... | 1.....1. | .. |
| <i>Geranium dissectum</i>                    | C  | ..1..21... | .1.....  | .. |
| <i>Galium tricornutum</i>                    | C  | ..1.2...2. | .....1.. | .. |
| <i>Galium spurium</i>                        | C  | .....13... | .....1.1 | .. |
| <i>Galeopsis ladanum</i>                     | C  | .....52... | 1....1.. | .. |
| <i>Agrostemma githago</i>                    | C  | 2....2...1 | 1.....   | .. |
| <i>Adonis aestivalis</i>                     | C  | 1.2.1..... | .....    | .. |
| <i>Lathyrus tuberosus</i>                    | C  | 44513.2211 | .23..212 | 41 |
| <i>Cyanus segetum</i>                        | C  | 34253341.1 | 22..1212 | .. |
| <i>Veronica persica</i>                      | tC | 453.144441 | 23..1312 | .. |
| <i>Euphorbia helioscopia</i>                 | tC | 342.22.221 | 13....11 | .. |
| <i>Anthemis austriaca</i>                    | tC | ..123...1  | .....1.. | .1 |
| <i>Trifolium arvense</i>                     | D  | ..131431.1 | 11.1.111 | .1 |
| <i>Vicia angustifolia</i>                    | D  | 451122321. | 22....1. | .. |
| <i>Trifolium campestre</i>                   | D  | 1211243..1 | 2....1.1 | .. |
| <i>Stachys palustris</i>                     | D  | 331..4141. | 42...11. | .. |
| <i>Viola tricolor</i>                        | D  | .....2113. | 1.....   | .. |
| <b><i>Atriplici-Chenopodietalia albi</i></b> |    |            |          |    |
| <i>Veronica agrestis</i>                     | C  | ..2....1.1 | .42..11. | .. |
| <i>Apera spica-venti</i>                     | tC | ..121..... | 113..111 | .. |
| <i>Chenopodium polyspermum</i>               | tC | ..1..2.11. | .1...511 | .. |
| <i>Spergula arvensis</i>                     | tC | 111...23.1 | 44...111 | .. |
| <i>Filaginella uliginosa</i>                 | tC | .21..3.1.. | 321..211 | .. |
| <b><i>Eragrostietalia</i></b>                |    |            |          |    |
| <i>Digitaria sanguinalis</i>                 | C  | ...11....1 | ...1..1. | 45 |
| <i>Portulaca oleracea</i>                    | C  | .....11    | ...1..1. | 25 |
| <i>Eragrostis minor</i>                      | C  | .....1     | .....11. | 53 |
| <i>Cynodon dactylon</i>                      | C  | .....      | .....1.  | 32 |
| <i>Salsola *ruthenica</i>                    | C  | .....      | .....1   | .. |
| <i>Panicum capillare</i>                     | C  | .....      | .....    | .. |
| <i>Hibiscus trionum</i>                      | C  | .....      | .....11. | 52 |
| <i>Tragus racemosus</i>                      | C  | .....      | .....    | .. |

Tab. 1. continued (1)

|                                    |    |             |          |    |
|------------------------------------|----|-------------|----------|----|
| <i>Chenopodium botrys</i>          | C  | .....       | .....    | .. |
| <i>Amaranthus crispus</i>          | C  | .....       | .....    | .. |
| <i>Setaria viridis</i>             | tC | ..1.32..3.  | 1....224 | .3 |
| <i>Senecio viscosus</i>            | D  | .....       | .....    | .. |
| <i>Psylidium arenarium</i>         | D  | .....       | 1.....   | .. |
| <i>Anthemis ruthenica</i>          | D  | ...11.....  | .....    | .. |
| <i>Saponaria officinalis</i>       | D  | .....       | .....    | .. |
| <i>Carex hirta</i>                 | D  | .....       | .....    | .1 |
| <i>Bryum argenteum</i>             | D  | .....       | .....    | .. |
| <b><i>Violenea arvensis</i></b>    |    |             |          |    |
| <i>Viola arvensis</i>              | C  | 3345544312  | 444.3211 | .. |
| <i>Raphanus raphanistrum</i>       | C  | 313.3434.1  | 45241212 | .. |
| <i>Anagallis arvensis</i>          | C  | 153125512.  | 2221.323 | .1 |
| <i>Sonchus arvensis</i>            | C  | 542134542.  | 341..212 | .1 |
| <i>Oxalis fontana</i>              | C  | ..12123.1.  | 1.1..411 | 21 |
| <i>Consolida regalis</i>           | C  | .1255.4..2  | 1.442111 | .. |
| <i>Anthemis arvensis</i>           | C  | 2.1.14522.  | 312.1112 | .. |
| <i>Vicia hirsuta</i>               | C  | 54253232.1  | 33331111 | .. |
| <i>Myosotis arvensis</i>           | C  | 4432144411  | 4421211. | .. |
| <i>Silene noctiflora</i>           | C  | 12222.1..1  | ..24..11 | .. |
| <i>Scleranthus annuus</i>          | C  | 11.1155111  | 32..2313 | .. |
| <i>Persicaria pallida</i>          | C  | 111.1..21.  | 11...212 | .. |
| <i>Vicia tetrasperma</i>           | C  | 1215222...1 | .23.111  | .. |
| <i>Veronica hederifolia</i> agg.   | C  | ..11...114  | .12.2.11 | 3. |
| <i>Veronica arvensis</i>           | C  | .21.12.111  | 21..111. | .. |
| <i>Sonchus asper</i>               | C  | ..1.1.412.  | 111..112 | .. |
| <i>Galeopsis tetrahit</i>          | C  | 432..2142.  | 54...11. | .. |
| <i>Ranunculus arvensis</i>         | C  | ..121.2..1  | ..2.111. | .. |
| <i>Galeopsis bifida</i>            | C  | 221....31.  | 41...1.. | .. |
| <i>Lycopsis arvensis</i>           | C  | .1.....111  | 1.12.... | .. |
| <i>Lolium temulentum</i>           | C  | 11.....     | 111...1. | .. |
| <i>Aphanes arvensis</i>            | C  | ....2....   | ..1.1.1. | .. |
| <i>Bromus secalinus</i>            | C  | ...1.....   | ....1..  | .. |
| <i>Mentha arvensis</i>             | D  | 552..5.41.  | 43...11. | .1 |
| <i>Stellaria graminea</i>          | D  | 11...2311.  | 31...1.. | .. |
| <i>Campanula rapunculoides</i>     | D  | 43...212..  | 21.....  | .. |
| <i>Vicia pannonica</i>             | D  | ...3.....   | ....1..  | .. |
| <b><i>Stellarietea mediae</i></b>  |    |             |          |    |
| <i>Chenopodium album</i>           |    | 1132524531  | 14351555 | 53 |
| <i>Tripleurospermum perforatum</i> |    | 2353235222  | 35453442 | 53 |
| <i>Conyza canadensis</i>           |    | ..12132.31  | ...4.211 | 13 |
| <i>Capsella bursa-pastoris</i>     |    | .1312.1343  | 12453332 | .3 |
| <i>Sonchus oleraceus</i>           |    | .311221111  | 11.1.222 | .. |
| <i>Amaranthus retroflexus</i>      |    | ...1...1.   | ..11.242 | 54 |
| <i>Atriplex patula</i>             |    | 121..34121  | 11.1.111 | .1 |
| <i>Fallopia convolvulus</i>        |    | 4543544511  | 3534.223 | .2 |



Tab. 1. continued (2)

|                                 |            |          |    |
|---------------------------------|------------|----------|----|
| <i>Stellaria media</i>          | 45342.3554 | 45452231 | .4 |
| <i>Persicaria maculata</i>      | 122.12231. | 241..222 | .. |
| <i>Thlaspi arvense</i>          | 11212.1111 | .1412211 | .1 |
| <i>Galinsoga parviflora</i>     | ..1...211. | 1.1..232 | 43 |
| <i>Sinapis arvensis</i>         | 54312..411 | .3311212 | .1 |
| <i>Persicaria *lapathifolia</i> | ..111.211. | 1.1..221 | 31 |
| <i>Papaver rhoeas</i>           | ..212.2.21 | ..31..11 | .. |
| <i>Solanum nigrum</i>           | ..1.1...1. | .....111 | 21 |
| <i>Echinochloa crus-galli</i>   | ..1.2..11. | ..1..453 | 34 |
| <i>Cardaria draba</i>           | ..111...11 | ..1.1.1. | .. |
| <i>Setaria pumila</i>           | ..11153.1. | .....335 | 53 |
| <i>Chenopodium hybridum</i>     | ..1.1..... | .....111 | .1 |
| <i>Stachys annua</i>            | ..113.3..1 | ..1.114  | 1. |
| <i>Senecio vulgaris</i>         | .11....131 | .1.1..1. | .. |
| <i>Lamium amplexicaule</i>      | .21.1..133 | 111.2211 | 3. |
| <i>Geranium pusillum</i>        | ..1....121 | .....1.  | .. |
| <i>Mercurialis annua</i>        | .....31    | .....11  | .. |
| <i>Matricaria recutita</i>      | ..1.2...1  | ..5..11. | .. |
| <i>Veronica polita</i>          | .11.2...31 | ....1111 | .. |
| <i>Fumaria officinalis</i>      | .12.1..23. | .....11  | .. |
| <i>Datura stramonium</i>        | .....      | .....11  | 21 |
| <i>Camelina microcarpa</i>      | ..1.1..... | ..1..11. | .. |
| <i>Buglossoides arvensis</i>    | 111...11.1 | ...111.  | .1 |
| <i>Anagallis foemina</i>        | ..1.2..... | .....11  | .. |
| <i>Diplotaxis muralis</i>       | .....1     | .....11  | .. |
| <i>Setaria verticilliformis</i> | .....      | .....11  | .. |
| <i>Amaranthus powellii</i>      | .....      | .....11. | 32 |
| <i>Vicia villosa</i>            | ..1.1...1  | 1..2.1.1 | .1 |
| <i>Gypsophila muralis</i>       | ...2.42... | ...2.212 | 21 |
| <i>Atriplex oblongifolia</i>    | .....      | .....1.1 | .. |
| <i>Amaranthus lividus</i>       | .....1.    | ..1...1. | 42 |
| <i>Lepidium densiflorum</i>     | .....      | ...1.... | .. |
| <i>Chenopodium suecicum</i>     | ..1....1.. | .....1.  | .. |
| <i>Hyoscyamus niger</i>         | .....      | .....1.  | 3. |
| <i>Fumaria vaillantii</i>       | ..11....1  | ..1....  | .1 |
| <i>Digitaria ischaemum</i>      | .....2..11 | 1....111 | .. |
| <i>Amaranthus albus</i>         | .....      | .....1.  | .. |
| <i>Euphorbia esula</i>          | .....1     | .....    | .. |
| <i>Kickxia spuria</i>           | ...2.....  | .....111 | .. |
| <i>Galinsoga ciliata</i>        | .....1..   | .....    | .. |
| <i>Chenopodium urbicum</i>      | .....      | .....    | .. |
| <i>Crepis capillaris</i>        | ...1.....  | .....    | .. |
| <i>Amaranthus blitoides</i>     | .....      | .....1.  | .. |
| <i>Ajuга chamaepitys</i>        | ...2.....  | .....2   | .. |
| <i>Papaver argemone</i>         | ...1...1   | .....    | .. |
| <i>Oxalis dillenii</i>          | .....      | .....    | .. |

Tab. 1. continued (3)

|   |                     |    |
|---|---------------------|----|
| <i>Fumaria rostellata</i>               | .....1              | .. |
| <i>Digitaria * pectiniformis</i>        | .....               | .. |
| <i>Cannabis sativa</i>                  | ....1.....          | .. |
| <i>Bromus arvensis</i>                  | .....1.....         | .. |
| <i>Peplis portula</i>                   | .....1....1..       | .. |
| <i>Chorispora tenella</i>               | .....               | .. |
| <i>Geranium columbinum</i>              | 1.....1.....        | .. |
| <i>Papaver dubium</i> agg.              | .....1.....         | .. |
| <i>Myosurus minimus</i>                 | .....1....1..       | .. |
| <i>Fumaria schleicheri</i>              | .....               | .. |
| <i>Consolida orientalis</i>             | .....1..            | .. |
| <i>Atriplex rosea</i>                   | .....               | .. |
| <i>Veronica triphyllos</i>              | .....3.....         | .. |
| <i>Veronica triloba</i>                 | .....1.....         | .. |
| <i>Sisymbrium irio</i>                  | .....               | .. |
| <i>Eragrostis cilianensis</i>           | .....               | 4. |
| <i>Myosotis ramosissima</i>             | .....1.....         | .. |
| <b>Other taxa</b>                       |                     |    |
| <i>Polygonum aviculare</i> agg.         | 4442255311 35.3.221 | .2 |
| <i>Convolvulus arvensis</i>             | 4332455341 23441335 | 34 |
| <i>Artemisia vulgaris</i>               | 1.111..111 .1.3.111 | 12 |
| <i>Taraxacum</i> sect. <i>Ruderalia</i> | 122..32232 22.22221 | 33 |
| <i>Plantago major</i>                   | 1112143111 1.13.321 | 41 |
| <i>Achillea millefolium</i> agg.        | 1.2..42321 3212.111 | .1 |
| <i>Elytrigia repens</i>                 | 4343143531 3344.322 | .1 |
| <i>Cirsium arvense</i>                  | 5433454541 44211335 | .2 |
| <i>Trifolium repens</i>                 | 1213331111 21.21212 | 22 |
| <i>Poa annua</i>                        | ..11...121 11.2111. | .1 |
| <i>Medicago lupulina</i>                | 452131412. 13.1.111 | .. |
| <i>Plantago lanceolata</i>              | ..11.42111 1...111  | .. |
| <i>Galium aparine</i>                   | 543.1.2521 352..111 | 31 |
| <i>Rumex crispus</i>                    | 3.111.3311 21..111. | .1 |
| <i>Silene *alba</i>                     | ..121.11.1 11...111 | 11 |
| <i>Erodium cicutarium</i>               | 1.1.1.1221 1212..12 | .1 |
| <i>Daucus carota</i>                    | ..1.243.21 .....111 | .. |
| <i>Equisetum arvense</i>                | 121112.311 22311221 | 31 |
| <i>Matricaria discoidea</i>             | .11....11. 11....1. | .1 |
| <i>Glechoma hederacea</i>               | .11..21111 111..11. | .1 |
| <i>Dactylis glomerata</i>               | .11....11 11.1..1.  | .. |
| <i>Cichorium intybus</i>                | ..111321.. .....111 | .1 |
| <i>Trifolium pratense</i>               | 121..41111 11.1.11. | .1 |
| <i>Reseda lutea</i>                     | ....1..... .....11  | .. |
| <i>Arenaria serpyllifolia</i>           | 121.2.1111 1..21111 | .. |
| <i>Ranunculus repens</i>                | 131..51211 21...11. | .1 |
| <i>Poa pratensis</i>                    | 111...1.1 11.1..1.  | .. |
| <i>Arctium lappa</i>                    | ..11...1.. .1.....  | .. |

Tab. 1. continued (4)

|                                |                   |          |    |
|--------------------------------|-------------------|----------|----|
| <i>Rorippa sylvestris</i>      | ..1..1111.        | 11...211 | .1 |
| <i>Linaria vulgaris</i>        | 1.1.14113.        | 11....1. | .. |
| <i>Chenopodium glaucum</i>     | .....11.          | .....11. | 2. |
| <i>Tanacetum vulgare</i>       | .....1            | .....11. | 11 |
| <i>Medicago sativa</i>         | .11.1...11        | ...3.111 | .1 |
| <i>Falcaria vulgaris</i>       | ..1.1...11        | .....11  | .. |
| <i>Echium vulgare</i>          | 1.1.12....        | .1.....  | .1 |
| <i>Pastinaca sativa</i>        | ..1.....          | .1...11. | .. |
| <i>Lamium purpureum</i>        | ..11...232        | .22.111. | .2 |
| <i>Tussilago farfara</i>       | 411..21311        | .4....11 | .. |
| <i>Potentilla anserina</i>     | 531...3..         | 34....1. | .. |
| <i>Arctium tomentosum</i>      | ..1.....          | ..1.111. | .. |
| <i>Arctium sp.</i>             | .....             | .....    | .. |
| <i>Melilotus officinalis</i>   | .11.1.....        | .....    | .. |
| <i>Lapsana communis</i>        | 422...1311        | 32...11. | .. |
| <i>Erysimum cheiranthoides</i> | ..1.....1.        | ....1111 | .. |
| <i>Artemisia absinthium</i>    | .....             | .....    | .. |
| <i>Rubus caesius</i>           | .....21..1        | .....1.  | .1 |
| <i>Microrrhinum minus</i>      | ..1.....1.        | .....111 | .. |
| <i>Euphorbia cyparissias</i>   | .....1.1          | .1.....1 | .. |
| <i>Bidens tripartita</i>       | .....11.          | 1...111  | 1. |
| <i>Agrostis stolonifera</i>    | .11..411..        | 1.....1. | .. |
| <i>Triticum aestivum</i>       | .....             | .....    | .. |
| <i>Poa compressa</i>           | 1.1..21... 1..... | .....    | .. |
| <i>Rumex acetosella</i>        | .....32111        | 211..1.. | .. |
| <i>Eryngium campestre</i>      | .....1.           | .....    | .. |
| <i>Vicia cracca</i>            | 42.....11.        | 3.....   | .. |
| <i>Symphytum officinale</i>    | ..1....1.1        | 11...11. | .. |
| <i>Lamium album</i>            | ..1....1..        | .3....1. | .. |
| <i>Cerastium *triviale</i>     | 1...111..         | 11.....  | .. |

The class includes the therophyte communities of the terrestrial, man-disturbed sites. The main reasons of disturbance are (1) regular tillage and (2) heaping or showering natural or anthropogenic material (KRIPPELOVÁ, MUCINA 1988). From the viewpoint of succession, the communities are either the first phases of the secondary succession (if the disturbance does not repeat or if its intensity decreases) or blocked successional stages (if the disturbance repeats regularly). The therophytes of ruderal life-strategy, well adapted to the inhabitation of fresh denuded or new-made sites, dominate in these communities.

There can be distinguished two subclasses within the class *Stellarietea mediae* according to floristic differences. They result from the completely different human influence upon the vegetation growing on the tilled soils and in the ruderal sites. Here are the subclasses: *Violenea arvensis* for the communities on the tilled soils and *Sisymbrienea* for the communities in the ruderal sites.

## ***Violenea arvensis* HÜPPE & HOFMEISTER ex JAROLÍMEK & al. 1997**

Weed communities on the tilled soils

**Nomenclatural type:** *Centaureetalia cyani* R. TX., LOHMEYER & PREISING in R.TX. ex VON ROCHOW 1951, holotype

**Syn:** *Violenea arvensis* HÜPPE & HOFMEISTER 1990 (article 5)

**Table** 1, columns 1- 18

**Characteristic taxa:** *Anagallis arvensis*, *Anthemis arvensis*, *Aphanes arvensis*, *Bromus secalinus*, *Consolida regalis*, *Fallopia convolvulus*, *Lolium temulentum*, *Lycopsis arvensis*, *Oxalis fontana*, *Ranunculus arvensis*, *Raphanus raphanistrum*, *Scleranthus annuus*, *Silene noctiflora*, *Sonchus arvensis*, *S. asper*, *Veronica arvensis*, *Veronica hederifolia*, *Vicia tetrasperma*, *V. hirsuta*, *Viola arvensis*.

**Differential taxa:** *Campanula rapunculoides*, *Mentha arvensis*, *Stellaria graminea*

In the subclass *Violenea arvensis*, the therophyte plant communities growing on the tilled soils in fields, gardens, vineyards and orchards are included. We have divided them into two orders in dependence on the character of the site and of agrotechnical procedures: *Centaureetalia cyani* (field-weed communities in cereals and root crops on basic to neutral soils) and *Atriplici-Chenopodietalia albi* (weed communities on neutral to acid substrate, in a moderately warm to cold climatic region, in the wheat-sugar beet type, in the stand of cereals and root crops).

Syntaxonomical note: HÜPPE & HOFMEISTER (1990) described a new subclass *Violenea arvensis* and new orders *Sperguletalia arvensis* (for basiphobic communities) and *Papaveretalia rhoeadis* (for basiphilous communities) without any nomenclatural types. Unfortunately, they have not solved even the nomenclatural relationships to the relevant older valid names of syntaxa in their special study aimed at the syntaxonomy of segetal communities in Germany.

### ***Centaureetalia cyani* R. TX., LOHMEYER & PREISING in R.TX. ex VON ROCHOW 1951**

Weed communities prevailing on nutritious soils.

**Syn.:** *Secalietalia* BR.-BL. 1931 (articles 3f, 8), *Secalietalia* BR.-BL. & al. 1936 (article 3f), *Secalino-Violetalia arvensis* BR.-BL. & R. TX. 1943 (articles 3f, 8), *Secalino-Violetalia arvensis* BR.-BL. & R. TX. ex SISSINGH in WESTHOFF & al. 1946 (article 3f), *Anagallidetalia* KNAPP 1948 (article 29), *Papaveretalia rhoeadis* HÜPPE & HOFMEISTER 1990 (articles 5, 29), *Stachyetalia annuae* RIES 1991 p.p. max. (article 1)

**Incl.:** „*Secalinetalia*” (BR.-BL. & al. 1936) SISSINGH in WESTHOFF & al. 1946 (subordo) (article 3f).

**Tables** 1 and 2, columns 1-10

**Table 2. Synoptic table of the order *Centaureetalia cyani***

1. *Rhinantho-Avenetum fatuae*
2. *Lathyro-Avenetum fatuae*
3. *Lathyro tuberosi-Adonidetum aestivalis*
4. *Consolido-Anthemidetum austriacae*
5. *Euphorbio exigue-Melandrietum noctiflori*
6. *Misopateto-Galeopsietum ladani*
7. *Consolido regalis-Misopatetum*
8. *Euphorbio helioscopiae-Veronicetum persicae*
9. *Setario viridis-Veronicetum politae*
10. *Veronicetum trilobae-triphylidi*

| Column                           | 1   | 2                      | 3                      | 4                      | 5                      | 6                      | 7                      | 8              | 9                      | 10                     |
|----------------------------------|-----|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|----------------|------------------------|------------------------|
| Number of relevés                | 18  | 8                      | 90                     | 21                     | 11                     | 13                     | 17                     | 110            | 107                    | 117                    |
| Average number of species        | 31  | 30                     | 23                     | 17                     | 24                     | 40                     | 35                     | 26             | 19                     | 8                      |
| <i>Rhinanthus alectorolophus</i> | C1  | <b>61</b> <sup>4</sup> | .                      | .                      | .                      | .                      | .                      | .              | .                      | .                      |
| <i>Vicia cracca</i>              | D1  | <b>67</b> <sup>2</sup> | 25 <sup>2</sup>        | .                      | .                      | .                      | .                      | 9 <sup>2</sup> | 1 <sup>3</sup>         | .                      |
| <i>Valerianella locusta</i>      | D2  | 17 <sup>2</sup>        | <b>38</b> <sup>2</sup> | .                      | .                      | .                      | .                      | 5 <sup>2</sup> | .                      | .                      |
| <i>Lathyrus pratensis</i>        | D2  | .                      | <b>13</b> <sup>2</sup> | .                      | .                      | .                      | .                      | .              | .                      | .                      |
| <i>Adonis aestivalis</i>         | D3  | 6 <sup>1</sup>         | .                      | <b>30</b> <sup>2</sup> | .                      | 14 <sup>4</sup>        | .                      | .              | .                      | .                      |
| <i>Vicia pannonica</i>           | D4  | .                      | .                      | .                      | <b>45</b> <sup>2</sup> | .                      | .                      | .              | .                      | .                      |
| <i>Euphorbia falcata</i>         | D5  | .                      | .                      | 8 <sup>2</sup>         | .                      | <b>43</b> <sup>2</sup> | .                      | .              | .                      | .                      |
| <i>Chamomilla recutita</i>       | D5  | .                      | .                      | 7 <sup>3</sup>         | .                      | <b>38</b> <sup>5</sup> | .                      | .              | .                      | 2 <sup>3</sup>         |
| <i>Euphorbia platyphyllos</i>    | D5  | .                      | .                      | .                      | .                      | <b>29</b> <sup>3</sup> | .                      | .              | .                      | .                      |
| <i>Ajuga chamaepitys</i>         | D5  | .                      | .                      | .                      | .                      | <b>29</b> <sup>3</sup> | .                      | .              | .                      | .                      |
| <i>Anagallis foemina</i>         | D5  | .                      | .                      | 8 <sup>2</sup>         | .                      | <b>29</b> <sup>3</sup> | .                      | .              | .                      | .                      |
| <i>Kickxia spuria</i>            | D5  | .                      | .                      | .                      | .                      | <b>29</b> <sup>2</sup> | .                      | .              | .                      | .                      |
| <i>Caucalis platycarpus</i>      | D5  | .                      | .                      | .                      | .                      | <b>10</b> <sup>3</sup> | .                      | .              | .                      | .                      |
| <i>Galeopsis ladanum</i>         | D6  | .                      | .                      | .                      | .                      | <b>92</b> <sup>7</sup> | 29 <sup>7</sup>        | .              | .                      | .                      |
| <i>Agrostis stolonifera</i>      | D6  | .                      | 13 <sup>1</sup>        | .                      | .                      | <b>62</b> <sup>7</sup> | 12 <sup>5</sup>        | 5 <sup>1</sup> | .                      | .                      |
| <i>Geranium dissectum</i>        | C6  | .                      | .                      | 2 <sup>3</sup>         | .                      | <b>31</b> <sup>5</sup> | 6 <sup>3</sup>         | .              | .                      | .                      |
| <i>Knautia arvensis</i>          | D6  | .                      | .                      | .                      | .                      | <b>31</b> <sup>5</sup> | 6 <sup>7</sup>         | .              | .                      | .                      |
| <i>Lotus corniculatus</i>        | D6  | .                      | .                      | .                      | .                      | <b>38</b> <sup>4</sup> | .                      | .              | .                      | .                      |
| <i>Aphanes arvensis</i>          | D6  | .                      | .                      | .                      | .                      | <b>23</b> <sup>3</sup> | .                      | .              | .                      | .                      |
| <i>Sonchus asper</i>             | D7  | .                      | .                      | 8 <sup>2</sup>         | .                      | 5 <sup>5</sup>         | <b>71</b> <sup>5</sup> | 5 <sup>2</sup> | 27 <sup>3</sup>        | .                      |
| <i>Spergularia rubra</i>         | D7  | .                      | .                      | .                      | .                      | .                      | <b>24</b> <sup>3</sup> | .              | .                      | .                      |
| <i>Valerianella rimosa</i>       | D7  | .                      | .                      | .                      | .                      | .                      | <b>18</b> <sup>3</sup> | .              | .                      | .                      |
| <i>Senecio vulgaris</i>          | D9  | .                      | 13 <sup>1</sup>        | 4 <sup>2</sup>         | .                      | .                      | .                      | 5 <sup>2</sup> | <b>56</b> <sup>4</sup> | 6 <sup>2</sup>         |
| <i>Mercurialis annua</i>         | D9  | .                      | .                      | .                      | .                      | .                      | .                      | .              | <b>47</b> <sup>5</sup> | 1 <sup>3</sup>         |
| <i>Veronica polita</i>           | D9  | .                      | 13 <sup>2</sup>        | 2 <sup>2</sup>         | .                      | 24 <sup>3</sup>        | .                      | .              | <b>43</b> <sup>4</sup> | 1 <sup>3</sup>         |
| <i>Cerastium brachypetalum</i>   | D9  | .                      | .                      | .                      | .                      | .                      | .                      | .              | <b>21</b> <sup>3</sup> | .                      |
| <i>Veronica hederifolia</i>      | C10 | .                      | .                      | 8 <sup>2</sup>         | 9 <sup>2</sup>         | .                      | .                      | 1 <sup>2</sup> | 10 <sup>3</sup>        | <b>68</b> <sup>4</sup> |
| <i>Veronica triphyllos</i>       | C10 | .                      | .                      | .                      | .                      | .                      | .                      | .              | .                      | <b>55</b> <sup>3</sup> |
| <i>Holosteum umbellatum</i>      | D10 | .                      | .                      | .                      | .                      | .                      | .                      | .              | .                      | <b>33</b> <sup>3</sup> |
| <i>Gagea pratensis</i>           | D10 | .                      | .                      | .                      | .                      | .                      | .                      | .              | .                      | <b>25</b> <sup>3</sup> |
| <i>Veronica triloba</i>          | D10 | .                      | .                      | .                      | .                      | .                      | .                      | .              | .                      | <b>9</b> <sup>4</sup>  |
| <i>Veronica verna</i>            | D10 | .                      | .                      | .                      | .                      | .                      | .                      | .              | .                      | <b>5</b> <sup>3</sup>  |

Tab. 2. continued (1)

|                                 |    |                  |                  |                 |                 |                 |                  |                 |                 |                                 |
|---------------------------------|----|------------------|------------------|-----------------|-----------------|-----------------|------------------|-----------------|-----------------|---------------------------------|
| <b>Caucalidion</b>              |    |                  |                  |                 |                 |                 |                  |                 |                 |                                 |
| <i>Melandrium noctiflorum</i>   | tC | 6 <sup>2</sup>   | 25 <sup>3</sup>  | 22 <sup>2</sup> | 27 <sup>2</sup> | 29 <sup>3</sup> | .                | 18 <sup>5</sup> | .               | 1 <sup>2</sup>                  |
| <i>Neslia paniculata</i>        | C  | 28 <sup>3</sup>  | 13 <sup>2</sup>  | 12 <sup>1</sup> | .               | 10 <sup>3</sup> | .                | .               | .               | .                               |
| <i>Anthemis austriaca</i>       | C  | .                | .                | 1 <sup>1</sup>  | 27 <sup>4</sup> | 43 <sup>3</sup> | .                | .               | .               | 3 <sup>3</sup>                  |
| <i>Vicia sativa</i>             | D  | 50 <sup>3</sup>  | .                | 20 <sup>2</sup> | .               | .               | .                | 2 <sup>1</sup>  | .               | .                               |
| <i>Veronica polita</i>          | D  | .                | 13 <sup>2</sup>  | 2 <sup>2</sup>  | 24 <sup>4</sup> | .               | .                | .               | .               | .                               |
| <i>Anthemis ruthenica</i>       | D  | .                | .                | .               | 9 <sup>7</sup>  | 10 <sup>6</sup> | .                | .               | .               | .                               |
| <b>Sherardion</b>               |    |                  |                  |                 |                 |                 |                  |                 |                 |                                 |
| <i>Misopates orontium</i>       | C  | .                | .                | .               | 10 <sup>3</sup> | 10 <sup>3</sup> | 85 <sup>6</sup>  | 94 <sup>7</sup> | .               | 4 <sup>3</sup>                  |
| <i>Kickxia elatine</i>          | C  | .                | .                | 4 <sup>2</sup>  | 9 <sup>1</sup>  | .               | 92 <sup>6</sup>  | 82 <sup>6</sup> | .               | .                               |
| <i>Valerianella dentata</i>     | C  | .                | .                | .               | .               | .               | 46 <sup>6</sup>  | 35 <sup>5</sup> | .               | .                               |
| <i>Galium spurium</i>           | C  | .                | .                | .               | .               | .               | 15 <sup>4</sup>  | 41 <sup>6</sup> | .               | .                               |
| <i>Daucus carota</i>            | D  | .                | .                | 1 <sup>1</sup>  | .               | 24 <sup>2</sup> | 77 <sup>7</sup>  | 53 <sup>6</sup> | .               | 21 <sup>2</sup>                 |
| <i>Lepidium campestre</i>       | D  | .                | .                | .               | .               | .               | 38 <sup>5</sup>  | 12 <sup>4</sup> | .               | .                               |
| <i>Filago arvensis</i>          | D  | .                | .                | .               | .               | .               | 23 <sup>3</sup>  | 18 <sup>3</sup> | .               | .                               |
| <b>Veronico-Euphorbion</b>      |    |                  |                  |                 |                 |                 |                  |                 |                 |                                 |
| <i>Lamium purpureum</i>         | D  | .                | .                | 10 <sup>2</sup> | 18 <sup>2</sup> | .               | .                | .               | 29 <sup>2</sup> | 55 <sup>3</sup> 37 <sup>3</sup> |
| <b>Centauretalia cyani</b>      |    |                  |                  |                 |                 |                 |                  |                 |                 |                                 |
| <i>Sherardia arvensis</i>       |    | 33 <sup>2</sup>  | 63 <sup>3</sup>  | 32 <sup>3</sup> | .               | 19 <sup>4</sup> | 92 <sup>5</sup>  | 35 <sup>5</sup> | 18 <sup>2</sup> | 3 <sup>2</sup>                  |
| <i>Centaurea cyanus</i>         |    | 50 <sup>2</sup>  | 63 <sup>3</sup>  | 32 <sup>2</sup> | .               | 52 <sup>5</sup> | 46 <sup>3</sup>  | 76 <sup>6</sup> | 11 <sup>2</sup> | 5 <sup>3</sup>                  |
| <i>Avena fatua</i>              |    | 100 <sup>3</sup> | 100 <sup>3</sup> | 39 <sup>3</sup> | .               | 10 <sup>2</sup> | .                | 59 <sup>5</sup> | 33 <sup>2</sup> | 3 <sup>2</sup>                  |
| <i>Aethusa cynapium</i>         |    | 11 <sup>2</sup>  | 13 <sup>3</sup>  | 25 <sup>3</sup> | 19 <sup>4</sup> | .               | 62 <sup>7</sup>  | 47 <sup>6</sup> | 3 <sup>2</sup>  | .                               |
| <i>Euphorbia exigua</i>         |    | .                | .                | 13 <sup>2</sup> | 43 <sup>3</sup> | 43 <sup>3</sup> | 77 <sup>6</sup>  | 65 <sup>6</sup> | .               | 1 <sup>2</sup>                  |
| <i>Fumaria officinalis</i>      |    | .                | 13 <sup>2</sup>  | 23 <sup>2</sup> | .               | 5 <sup>1</sup>  | .                | .               | 21 <sup>3</sup> | 52 <sup>3</sup>                 |
| <i>Fumaria vaillantii</i>       |    | .                | .                | 3 <sup>2</sup>  | 18 <sup>2</sup> | 10 <sup>2</sup> | .                | .               | .               | 2 <sup>2</sup>                  |
| <i>Agrostemma githago</i>       |    | 28 <sup>3</sup>  | .                | .               | .               | .               | 23 <sup>4</sup>  | .               | .               | 2 <sup>3</sup>                  |
| <i>Galium tricornutum</i>       |    | .                | .                | 2 <sup>3</sup>  | .               | 24 <sup>4</sup> | .                | .               | 26 <sup>3</sup> | .                               |
| <i>Veronica agrestis</i>        |    | .                | .                | 24 <sup>4</sup> | .               | .               | .                | .               | 15 <sup>3</sup> | 5 <sup>3</sup>                  |
| <i>Papaver argemone</i>         |    | .                | .                | .               | .               | 5 <sup>3</sup>  | .                | .               | .               | 2 <sup>5</sup>                  |
| <b>Stellarietea mediae</b>      |    |                  |                  |                 |                 |                 |                  |                 |                 |                                 |
| <i>Fallopia convolvulus</i>     |    | 78 <sup>2</sup>  | 100 <sup>2</sup> | 74 <sup>4</sup> | 45 <sup>2</sup> | 81 <sup>4</sup> | 69 <sup>6</sup>  | 76 <sup>6</sup> | 82 <sup>3</sup> | 19 <sup>3</sup> 11 <sup>2</sup> |
| <i>Myosotis arvensis</i>        |    | 72 <sup>2</sup>  | 63 <sup>2</sup>  | 51 <sup>2</sup> | 27 <sup>2</sup> | 5 <sup>2</sup>  | 69 <sup>6</sup>  | 71 <sup>5</sup> | 63 <sup>2</sup> | 5 <sup>2</sup> 4 <sup>2</sup>   |
| <i>Polygonum aviculare</i> agg. |    | 61 <sup>2</sup>  | 63 <sup>2</sup>  | 67 <sup>3</sup> | 27 <sup>3</sup> | 33 <sup>3</sup> | 92 <sup>7</sup>  | 88 <sup>6</sup> | 60 <sup>3</sup> | 9 <sup>2</sup> 2 <sup>2</sup>   |
| <i>Matricaria perforata</i>     |    | 33 <sup>2</sup>  | 50 <sup>6</sup>  | 83 <sup>4</sup> | 55 <sup>3</sup> | 29 <sup>3</sup> | 46 <sup>5</sup>  | 88 <sup>7</sup> | 39 <sup>3</sup> | 32 <sup>3</sup> 33 <sup>3</sup> |
| <i>Chenopodium album</i>        |    | 17 <sup>2</sup>  | 13 <sup>2</sup>  | 44 <sup>2</sup> | 36 <sup>2</sup> | 81 <sup>3</sup> | 38 <sup>3</sup>  | 71 <sup>4</sup> | 83 <sup>4</sup> | 60 <sup>4</sup> 3 <sup>2</sup>  |
| <i>Anagallis arvensis</i>       |    | 17 <sup>2</sup>  | 88 <sup>2</sup>  | 42 <sup>2</sup> | 9 <sup>2</sup>  | 33 <sup>3</sup> | 92 <sup>7</sup>  | 94 <sup>6</sup> | 8 <sup>2</sup>  | 21 <sup>3</sup>                 |
| <i>Vicia hirsuta</i>            |    | 100 <sup>2</sup> | 75 <sup>2</sup>  | 27 <sup>2</sup> | 00 <sup>3</sup> | 48 <sup>3</sup> | 31 <sup>7</sup>  | 53 <sup>6</sup> | 39 <sup>2</sup> | 6 <sup>2</sup>                  |
| <i>Equisetum arvense</i>        |    | 11 <sup>3</sup>  | 38 <sup>2</sup>  | 17 <sup>2</sup> | 9 <sup>3</sup>  | 14 <sup>2</sup> | 23 <sup>6</sup>  | .               | 42 <sup>3</sup> | 2 <sup>3</sup> 14 <sup>3</sup>  |
| <i>Stellaria media</i>          |    | 78 <sup>3</sup>  | 88 <sup>3</sup>  | 54 <sup>3</sup> | 64 <sup>3</sup> | 38 <sup>2</sup> | .                | 41 <sup>5</sup> | 89 <sup>4</sup> | 90 <sup>5</sup> 61 <sup>4</sup> |
| <i>Lathyrus tuberosus</i>       |    | 78 <sup>3</sup>  | 75 <sup>3</sup>  | 82 <sup>3</sup> | 18 <sup>2</sup> | 43 <sup>4</sup> | .                | 35 <sup>6</sup> | 28 <sup>2</sup> | 2 <sup>3</sup> 1 <sup>2</sup>   |
| <i>Thlaspi arvense</i>          |    | 11 <sup>2</sup>  | 13 <sup>2</sup>  | 34 <sup>2</sup> | 9 <sup>3</sup>  | 24 <sup>3</sup> | .                | 18 <sup>3</sup> | 14 <sup>2</sup> | 15 <sup>3</sup> 12 <sup>3</sup> |
| <i>Veronica persica</i>         |    | 78 <sup>2</sup>  | 88 <sup>2</sup>  | 46 <sup>3</sup> | .               | 19 <sup>4</sup> | 62 <sup>5</sup>  | 65 <sup>6</sup> | 77 <sup>3</sup> | 73 <sup>4</sup> 2 <sup>3</sup>  |
| <i>Scleranthus annuus</i>       |    | 17 <sup>3</sup>  | 13 <sup>2</sup>  | .               | 9 <sup>5</sup>  | 19 <sup>3</sup> | 100 <sup>6</sup> | 82 <sup>7</sup> | 17 <sup>2</sup> | 2 <sup>3</sup> 2 <sup>3</sup>   |
| <i>Sonchus oleraceus</i>        |    | .                | 50 <sup>2</sup>  | 14 <sup>2</sup> | 9 <sup>2</sup>  | 24 <sup>2</sup> | 23 <sup>4</sup>  | 6 <sup>3</sup>  | 6 <sup>2</sup>  | 18 <sup>2</sup> 1 <sup>1</sup>  |
| <i>Cirsium arvense</i>          |    | 94 <sup>4</sup>  | 75 <sup>3</sup>  | 52 <sup>2</sup> | .               | 62 <sup>3</sup> | 85 <sup>7</sup>  | 71 <sup>7</sup> | 89 <sup>3</sup> | 70 <sup>3</sup> 12 <sup>2</sup> |
| <i>Convolvulus arvensis</i>     |    | 78 <sup>3</sup>  | 50 <sup>2</sup>  | 59 <sup>3</sup> | .               | 67 <sup>4</sup> | 92 <sup>6</sup>  | 82 <sup>8</sup> | 55 <sup>3</sup> | 61 <sup>4</sup> 13 <sup>3</sup> |

Tab. 2. continued (2)

|                                |                  |                 |                 |                 |                 |                 |                 |                 |                 |                 |
|--------------------------------|------------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| <i>Elytrigia repens</i>        | 72 <sup>3</sup>  | 50 <sup>3</sup> | 61 <sup>4</sup> | .               | 19 <sup>3</sup> | 77 <sup>6</sup> | 53 <sup>8</sup> | 89 <sup>4</sup> | 48 <sup>3</sup> | 15 <sup>4</sup> |
| <i>Euphorbia helioscopia</i>   | 44 <sup>2</sup>  | 63 <sup>2</sup> | 36 <sup>2</sup> | .               | 24 <sup>3</sup> | 31 <sup>3</sup> | .               | 39 <sup>2</sup> | 21 <sup>3</sup> | 2 <sup>2</sup>  |
| <i>Atriplex patula</i>         | 17 <sup>2</sup>  | 38 <sup>2</sup> | 11 <sup>3</sup> | .               | .               | 54 <sup>5</sup> | 65 <sup>5</sup> | 12 <sup>3</sup> | 23 <sup>2</sup> | 1 <sup>1</sup>  |
| <i>Capsella bursa-pastoris</i> | .                | 13 <sup>1</sup> | 53 <sup>2</sup> | 9 <sup>2</sup>  | 33 <sup>2</sup> | .               | 18 <sup>4</sup> | 42 <sup>2</sup> | 64 <sup>4</sup> | 52 <sup>3</sup> |
| <i>Sonchus arvensis</i>        | 100 <sup>3</sup> | 75 <sup>4</sup> | 35 <sup>2</sup> | 9 <sup>2</sup>  | 48 <sup>4</sup> | .               | .               | 75 <sup>2</sup> | 31 <sup>3</sup> | .               |
| <i>Sinapis arvensis</i>        | 94 <sup>3</sup>  | 75 <sup>3</sup> | 48 <sup>2</sup> | 18 <sup>3</sup> | 24 <sup>3</sup> | .               | .               | .               | 71              | 9               |
| <i>Raphanus raphanistrum</i>   | 44 <sup>2</sup>  | 13 <sup>2</sup> | 46 <sup>2</sup> | .               | 57 <sup>2</sup> | .               | 6               | 59 <sup>4</sup> | 6               | .               |
| <i>Galeopsis tetrahit</i>      | 78 <sup>3</sup>  | 50 <sup>3</sup> | 27 <sup>3</sup> | .               | .               | 38 <sup>2</sup> | 12 <sup>5</sup> | 80 <sup>3</sup> | 25 <sup>4</sup> | .               |
| <i>Anthemis arvensis</i>       | 33 <sup>3</sup>  | .               | 7 <sup>2</sup>  | .               | 5 <sup>2</sup>  | 77 <sup>6</sup> | 82 <sup>6</sup> | 23 <sup>2</sup> | 30 <sup>4</sup> | .               |
| <i>Veronica arvensis</i>       | .                | 38 <sup>2</sup> | 16 <sup>3</sup> | .               | 5 <sup>2</sup>  | 23 <sup>5</sup> | .               | 10 <sup>2</sup> | 7 <sup>3</sup>  | 1 <sup>2</sup>  |
| <i>Vicia tetrasperma</i>       | 6 <sup>2</sup>   | 25 <sup>2</sup> | 13 <sup>2</sup> | 33 <sup>2</sup> | .               | 23 <sup>2</sup> | 24 <sup>4</sup> | .               | .               | .               |
| <i>Buglossoides arvensis</i>   | 6 <sup>2</sup>   | 13 <sup>2</sup> | 6 <sup>3</sup>  | .               | .               | .               | 12 <sup>3</sup> | 5 <sup>2</sup>  | .               | 10 <sup>3</sup> |
| <i>Spergula arvensis</i>       | 6 <sup>2</sup>   | 13 <sup>2</sup> | .               | .               | .               | 69 <sup>7</sup> | 82 <sup>7</sup> | 42 <sup>3</sup> | .               | 1 <sup>1</sup>  |
| <i>Consolida regalis</i>       | .                | 13 <sup>2</sup> | 40 <sup>3</sup> | 82 <sup>2</sup> | 81 <sup>4</sup> | .               | 76 <sup>6</sup> | .               | .               | 23 <sup>3</sup> |
| <i>Lamium amplexicaule</i>     | .                | 25 <sup>2</sup> | 4 <sup>1</sup>  | .               | 14 <sup>2</sup> | .               | .               | 15 <sup>2</sup> | 58 <sup>3</sup> | 45 <sup>2</sup> |
| <i>Oxalis fontana</i>          | .                | .               | 3 <sup>2</sup>  | 36 <sup>4</sup> | 14 <sup>3</sup> | 31 <sup>5</sup> | 41 <sup>7</sup> | .               | 10 <sup>3</sup> | .               |
| <i>Setaria pumila</i>          | .                | .               | 1 <sup>1</sup>  | 9 <sup>3</sup>  | 19 <sup>3</sup> | 85 <sup>6</sup> | 59 <sup>6</sup> | .               | 2 <sup>2</sup>  | .               |
| <i>Papaver rhoeas</i>          | .                | .               | 36 <sup>2</sup> | 18 <sup>2</sup> | 29 <sup>2</sup> | .               | 24 <sup>3</sup> | .               | 21 <sup>3</sup> | 6 <sup>2</sup>  |
| <i>Conyza canadensis</i>       | .                | .               | 7 <sup>2</sup>  | .               | 5 <sup>2</sup>  | 46 <sup>6</sup> | 35 <sup>5</sup> | .               | 44 <sup>4</sup> | 14 <sup>2</sup> |
| <i>Stachys annua</i>           | .                | .               | 16 <sup>2</sup> | 18 <sup>2</sup> | 52 <sup>7</sup> | .               | 47 <sup>6</sup> | .               | .               | 1 <sup>2</sup>  |
| <i>Ranunculus arvensis</i>     | .                | .               | 10 <sup>2</sup> | 27 <sup>2</sup> | 10 <sup>2</sup> | .               | 24 <sup>4</sup> | .               | .               | 6 <sup>2</sup>  |
| <i>Chamomilla suaveolens</i>   | .                | 13 <sup>2</sup> | 12 <sup>2</sup> | .               | .               | .               | .               | 13 <sup>2</sup> | 5 <sup>2</sup>  | .               |
| <i>Lycopsis arvensis</i>       | .                | 13 <sup>1</sup> | .               | .               | .               | .               | .               | 7 <sup>2</sup>  | 7 <sup>3</sup>  | 2 <sup>2</sup>  |
| <i>Setaria viridis</i>         | .                | .               | 2 <sup>2</sup>  | .               | 48 <sup>6</sup> | 38 <sup>5</sup> | .               | .               | 41 <sup>4</sup> | .               |
| <i>Echinochloa crus-galli</i>  | .                | .               | 9 <sup>2</sup>  | .               | 29 <sup>4</sup> | .               | .               | 2 <sup>2</sup>  | 1 <sup>3</sup>  | .               |
| <i>Chenopodium polyspermum</i> | .                | .               | 3 <sup>2</sup>  | .               | .               | 23 <sup>3</sup> | .               | 12 <sup>2</sup> | 1 <sup>3</sup>  | .               |
| <i>Galinsoga parviflora</i>    | .                | .               | 2 <sup>2</sup>  | .               | .               | .               | 24 <sup>4</sup> | 5 <sup>4</sup>  | 18 <sup>3</sup> | .               |
| <i>Geranium pusillum</i>       | .                | .               | 1 <sup>1</sup>  | .               | .               | .               | .               | 9 <sup>2</sup>  | 25 <sup>3</sup> | 2 <sup>2</sup>  |
| <i>Apera spica-venti</i>       | .                | .               | 1 <sup>1</sup>  | 27 <sup>3</sup> | 10 <sup>4</sup> | .               | .               | .               | .               | .               |
| <i>Solanum nigrum</i>          | .                | .               | 1 <sup>1</sup>  | .               | 5 <sup>5</sup>  | .               | .               | .               | 15 <sup>3</sup> | .               |
| <i>Digitaria sanguinalis</i>   | .                | .               | 9 <sup>3</sup>  | .               | 5 <sup>3</sup>  | .               | .               | .               | .               | 2 <sup>2</sup>  |
| <i>Lactuca serriola</i>        | .                | .               | 4 <sup>2</sup>  | .               | 10 <sup>2</sup> | .               | .               | .               | .               | 6 <sup>2</sup>  |
| <i>Descurainia sophia</i>      | .                | .               | 1 <sup>1</sup>  | .               | 14 <sup>2</sup> | .               | .               | .               | .               | 7 <sup>2</sup>  |
| <i>Digitaria ischaemum</i>     | .                | .               | .               | .               | .               | 23 <sup>8</sup> | .               | .               | 1 <sup>1</sup>  | 1 <sup>3</sup>  |
| <i>Camelina microcarpa</i>     | .                | .               | 8 <sup>1</sup>  | .               | 5 <sup>7</sup>  | .               | .               | .               | .               | .               |
| <i>Chenopodium hybridum</i>    | .                | .               | 1 <sup>1</sup>  | .               | 5 <sup>2</sup>  | .               | .               | .               | .               | .               |
| <i>Bromus sterilis</i>         | .                | .               | .               | 18 <sup>2</sup> | .               | .               | .               | .               | .               | 1 <sup>2</sup>  |
| <i>Amaranthus retroflexus</i>  | .                | .               | .               | .               | 19 <sup>3</sup> | .               | .               | .               | 14 <sup>5</sup> | .               |
| <i>Xanthium strumarium</i>     | .                | .               | .               | .               | 5 <sup>3</sup>  | .               | .               | .               | .               | 5 <sup>3</sup>  |
| <i>Portulaca oleracea</i>      | .                | .               | .               | .               | .               | .               | .               | .               | 1 <sup>1</sup>  | 1 <sup>3</sup>  |
| <i>Polycnemum arvense</i>      | .                | .               | 1 <sup>1</sup>  | .               | .               | .               | .               | .               | .               | .               |
| <i>Sinapis alba</i>            | .                | .               | .               | .               | 5 <sup>2</sup>  | .               | .               | .               | .               | .               |
| <i>Galinsoga ciliata</i>       | .                | .               | .               | .               | .               | .               | .               | 5 <sup>1</sup>  | .               | .               |
| <i>Chenopodium suecicum</i>    | .                | .               | .               | .               | .               | .               | .               | 1 <sup>2</sup>  | .               | .               |
| <i>Amaranthus lividus</i>      | .                | .               | .               | .               | .               | .               | .               | .               | 11 <sup>3</sup> | .               |
| <i>Urtica urens</i>            | .                | .               | .               | .               | .               | .               | .               | .               | 2 <sup>1</sup>  | .               |

Tab. 2. continued (3)

|                                |                 |                  |                 |                 |                 |                 |                 |                 |                 |                 |
|--------------------------------|-----------------|------------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| <i>Malva neglecta</i>          | .               | .                | .               | .               | .               | .               | .               | .               | 1 <sup>3</sup>  | .               |
| <i>Diplotaxis muralis</i>      | .               | .                | .               | .               | .               | .               | .               | .               | .               | 2 <sup>2</sup>  |
| <i>Myosotis ramosissima</i>    | .               | .                | .               | .               | .               | .               | .               | .               | .               | 2 <sup>2</sup>  |
| <i>Myosurus minimus</i>        | .               | .                | .               | .               | .               | .               | .               | .               | .               | 1 <sup>3</sup>  |
| <i>Eragrostis minor</i>        | .               | .                | .               | .               | .               | .               | .               | .               | .               | 1 <sup>1</sup>  |
| <b>Other taxa</b>              |                 |                  |                 |                 |                 |                 |                 |                 |                 |                 |
| <i>Trifolium repens</i>        | 17 <sup>3</sup> | 38 <sup>2</sup>  | 23 <sup>3</sup> | 45 <sup>2</sup> | 43 <sup>3</sup> | 46 <sup>6</sup> | 12 <sup>2</sup> | 2 <sup>1</sup>  | 2 <sup>3</sup>  | 5 <sup>3</sup>  |
| <i>Plantago major</i>          | 6 <sup>2</sup>  | 13 <sup>2</sup>  | 18 <sup>2</sup> | 27 <sup>2</sup> | 14 <sup>2</sup> | 62 <sup>6</sup> | 59 <sup>7</sup> | 10 <sup>2</sup> | 14 <sup>3</sup> | 1 <sup>2</sup>  |
| <i>Vicia angustifolia</i>      | 78 <sup>2</sup> | 88 <sup>2</sup>  | 7 <sup>3</sup>  | 9 <sup>3</sup>  | 24 <sup>3</sup> | 38 <sup>4</sup> | 47 <sup>4</sup> | 24 <sup>2</sup> | 1 <sup>2</sup>  | .               |
| <i>Medicago lupulina</i>       | 61 <sup>2</sup> | 100 <sup>2</sup> | 39 <sup>2</sup> | 8               | 48 <sup>4</sup> | 8 <sup>3</sup>  | 65 <sup>5</sup> | 10 <sup>2</sup> | 25 <sup>3</sup> | .               |
| <i>Viola arvensis</i>          | 44 <sup>2</sup> | 50 <sup>2</sup>  | 77 <sup>3</sup> | 86 <sup>3</sup> | .               | 69 <sup>7</sup> | 76 <sup>6</sup> | 41 <sup>2</sup> | 2 <sup>2</sup>  | 25 <sup>2</sup> |
| <i>Trifolium campestre</i>     | 6 <sup>2</sup>  | 38 <sup>2</sup>  | 1 <sup>2</sup>  | 9 <sup>2</sup>  | 38 <sup>2</sup> | 62 <sup>5</sup> | 59 <sup>5</sup> | .               | .               | 1 <sup>2</sup>  |
| <i>Polygonum persicaria</i>    | 11 <sup>2</sup> | 38 <sup>2</sup>  | 24 <sup>2</sup> | .               | 5 <sup>2</sup>  | 38 <sup>3</sup> | 35 <sup>7</sup> | 47 <sup>2</sup> | 16 <sup>3</sup> | .               |
| <i>Galium aparine</i>          | 94 <sup>3</sup> | 63 <sup>3</sup>  | 43 <sup>3</sup> | .               | 10 <sup>2</sup> | .               | 35 <sup>6</sup> | 93 <sup>3</sup> | 26 <sup>4</sup> | 3 <sup>1</sup>  |
| <i>Arenaria serpyllifolia</i>  | 11 <sup>2</sup> | 25 <sup>2</sup>  | 3 <sup>2</sup>  | .               | 24 <sup>3</sup> | .               | 18 <sup>6</sup> | 1 <sup>1</sup>  | 6 <sup>4</sup>  | 5 <sup>2</sup>  |
| <i>Ranunculus repens</i>       | 17 <sup>2</sup> | 50 <sup>3</sup>  | 10 <sup>2</sup> | .               | .               | 85 <sup>7</sup> | 6 <sup>9</sup>  | 27 <sup>2</sup> | 11 <sup>2</sup> | 1 <sup>2</sup>  |
| <i>Trifolium pratense</i>      | 11 <sup>3</sup> | 38 <sup>3</sup>  | 18 <sup>3</sup> | .               | .               | 69 <sup>4</sup> | 18 <sup>3</sup> | 3 <sup>2</sup>  | 1 <sup>2</sup>  | 1 <sup>1</sup>  |
| <i>Taraxacum officinale</i>    | 11 <sup>2</sup> | 38 <sup>2</sup>  | 39 <sup>2</sup> | .               | .               | 54 <sup>5</sup> | 24 <sup>3</sup> | 25 <sup>2</sup> | 45 <sup>2</sup> | 24 <sup>2</sup> |
| <i>Rumex crispus</i>           | 50 <sup>2</sup> | .                | 12 <sup>1</sup> | 9 <sup>1</sup>  | 5               | .               | 47 <sup>4</sup> | 45 <sup>2</sup> | 9 <sup>3</sup>  | 3 <sup>1</sup>  |
| <i>Lapsana communis</i>        | 61 <sup>2</sup> | 25 <sup>2</sup>  | 30 <sup>2</sup> | .               | .               | .               | 18 <sup>6</sup> | 48 <sup>2</sup> | 9 <sup>3</sup>  | 5 <sup>2</sup>  |
| <i>Tussilago farfara</i>       | 78 <sup>3</sup> | 13 <sup>3</sup>  | .               | .               | .               | 31 <sup>7</sup> | 12 <sup>6</sup> | 55 <sup>3</sup> | 7 <sup>3</sup>  | 1 <sup>2</sup>  |
| <i>Artemisia vulgaris</i>      | 6 <sup>1</sup>  | .                | 4 <sup>1</sup>  | 18 <sup>2</sup> | 5 <sup>2</sup>  | .               | .               | 7 <sup>2</sup>  | 14 <sup>3</sup> | 2 <sup>2</sup>  |
| <i>Linaria vulgaris</i>        | 17 <sup>2</sup> | .                | 1 <sup>2</sup>  | .               | 5 <sup>2</sup>  | 77 <sup>5</sup> | 18 <sup>4</sup> | 5 <sup>2</sup>  | 50 <sup>4</sup> | .               |
| <i>Erodium cicutarium</i>      | 17 <sup>2</sup> | .                | 14 <sup>2</sup> | .               | 19 <sup>3</sup> | .               | 18 <sup>5</sup> | 25 <sup>2</sup> | 34 <sup>3</sup> | 8 <sup>3</sup>  |
| <i>Achillea millefolium</i>    | 17 <sup>2</sup> | .                | 28 <sup>2</sup> | .               | .               | 69 <sup>6</sup> | 24 <sup>6</sup> | 44 <sup>2</sup> | 6 <sup>3</sup>  | 2 <sup>2</sup>  |
| <i>Glechoma hederacea</i>      | .               | 13 <sup>1</sup>  | 3 <sup>1</sup>  | .               | .               | 38 <sup>6</sup> | 6 <sup>5</sup>  | 2 <sup>1</sup>  | 4 <sup>1</sup>  | 6 <sup>2</sup>  |
| <i>Trifolium arvense</i>       | .               | .                | 10 <sup>2</sup> | 55 <sup>3</sup> | 5 <sup>3</sup>  | 62 <sup>7</sup> | 47 <sup>5</sup> | 3 <sup>2</sup>  | .               | 1 <sup>3</sup>  |
| <i>Plantago lanceolata</i>     | .               | .                | 2 <sup>2</sup>  | 9 <sup>2</sup>  | .               | 62 <sup>4</sup> | 29 <sup>4</sup> | 2 <sup>2</sup>  | 7 <sup>2</sup>  | 1 <sup>2</sup>  |
| <i>Polygonum tomentosum</i>    | 17 <sup>2</sup> | 13 <sup>2</sup>  | 7 <sup>2</sup>  | .               | 10 <sup>3</sup> | .               | .               | 21 <sup>2</sup> | 3 <sup>2</sup>  | .               |
| <i>Mentha arvensis</i>         | 89 <sup>3</sup> | 88 <sup>2</sup>  | 28 <sup>3</sup> | .               | .               | 85 <sup>7</sup> | .               | 77 <sup>2</sup> | 6 <sup>3</sup>  | .               |
| <i>Trifolium hybridum</i>      | 56 <sup>4</sup> | 25 <sup>4</sup>  | 2 <sup>3</sup>  | .               | .               | .               | .               | 5 <sup>2</sup>  | 1 <sup>2</sup>  | 1 <sup>3</sup>  |
| <i>Stachys palustris</i>       | 44 <sup>2</sup> | 50 <sup>2</sup>  | .               | .               | .               | 77 <sup>7</sup> | 6 <sup>8</sup>  | 66 <sup>2</sup> | 4 <sup>3</sup>  | .               |
| <i>Stellaria graminea</i>      | 11 <sup>2</sup> | 13 <sup>2</sup>  | .               | .               | .               | 38 <sup>5</sup> | 41 <sup>4</sup> | 7 <sup>2</sup>  | 1 <sup>3</sup>  | .               |
| <i>Cichorium intybus</i>       | .               | .                | 7 <sup>2</sup>  | 18 <sup>2</sup> | 5 <sup>2</sup>  | .               | 46 <sup>4</sup> | 29 <sup>4</sup> | 1 <sup>1</sup>  | .               |
| <i>Galeopsis bifida</i>        | 33 <sup>2</sup> | 38 <sup>2</sup>  | 2 <sup>2</sup>  | .               | .               | .               | .               | 43 <sup>2</sup> | 4 <sup>3</sup>  | .               |
| <i>Poa pratensis</i>           | 6 <sup>3</sup>  | 13 <sup>2</sup>  | 2 <sup>1</sup>  | .               | .               | .               | .               | 2 <sup>1</sup>  | .               | 1 <sup>5</sup>  |
| <i>Campanula rapunculoides</i> | 61 <sup>2</sup> | 50 <sup>2</sup>  | .               | .               | .               | 23 <sup>4</sup> | 6 <sup>8</sup>  | 25 <sup>2</sup> | .               | .               |
| <i>Medicago sativa</i>         | .               | 13 <sup>1</sup>  | 3 <sup>1</sup>  | .               | 14 <sup>4</sup> | .               | .               | .               | 1 <sup>1</sup>  | 1 <sup>5</sup>  |
| <i>Melandrium album</i>        | .               | .                | 9 <sup>2</sup>  | 27 <sup>2</sup> | 5 <sup>2</sup>  | .               | .               | 18 <sup>2</sup> | .               | 3 <sup>3</sup>  |
| <i>Cardaria draba</i>          | .               | .                | 3 <sup>2</sup>  | 18 <sup>2</sup> | 5 <sup>3</sup>  | .               | .               | .               | 13 <sup>4</sup> | 17 <sup>5</sup> |
| <i>Poa annua</i>               | .               | .                | 4 <sup>3</sup>  | 9 <sup>2</sup>  | .               | .               | .               | 9 <sup>2</sup>  | 22 <sup>2</sup> | 7 <sup>2</sup>  |
| <i>Rorippa sylvestris</i>      | .               | .                | 4 <sup>2</sup>  | .               | .               | 15 <sup>4</sup> | 6 <sup>3</sup>  | 11 <sup>3</sup> | 1 <sup>3</sup>  | .               |
| <i>Rumex acetosella</i>        | .               | .                | .               | .               | .               | 46 <sup>5</sup> | 35 <sup>4</sup> | 11 <sup>3</sup> | 1 <sup>3</sup>  | 3 <sup>2</sup>  |
| <i>Potentilla anserina</i>     | 83 <sup>3</sup> | 50 <sup>3</sup>  | 18 <sup>2</sup> | .               | .               | .               | .               | 59 <sup>2</sup> | .               | .               |
| <i>Phleum pratense</i>         | 11 <sup>2</sup> | 25 <sup>4</sup>  | 7 <sup>2</sup>  | .               | .               | .               | .               | 3 <sup>1</sup>  | .               | .               |
| <i>Festuca pratensis</i>       | 28 <sup>2</sup> | 13 <sup>2</sup>  | .               | .               | .               | .               | .               | 6 <sup>2</sup>  | 1 <sup>2</sup>  | .               |



Tab. 2. continued (4)

|                                |                 |                 |                 |                 |                 |                 |                 |                 |                 |                |
|--------------------------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|----------------|
| <i>Echium vulgare</i>          | 6 <sup>1</sup>  | .               | 3 <sup>1</sup>  | .               | 5 <sup>2</sup>  | 23 <sup>6</sup> | .               | .               | .               | .              |
| <i>Poa compressa</i>           | 6 <sup>1</sup>  | .               | 1 <sup>1</sup>  | .               | .               | 23 <sup>8</sup> | 18 <sup>5</sup> | .               | .               | .              |
| <i>Alchemilla vulgaris</i>     | 6 <sup>1</sup>  | .               | 1 <sup>2</sup>  | .               | .               | .               | .               | 2 <sup>2</sup>  | 4 <sup>2</sup>  | .              |
| <i>Cerastium holosteoides</i>  | 11 <sup>2</sup> | .               | .               | .               | .               | 15 <sup>2</sup> | 6 <sup>2</sup>  | 2 <sup>1</sup>  | .               | .              |
| <i>Filaginella uliginosa</i>   | .               | 25 <sup>2</sup> | 6 <sup>2</sup>  | .               | .               | 46 <sup>6</sup> | .               | 14 <sup>2</sup> | .               | .              |
| <i>Dactylis glomerata</i>      | .               | 13 <sup>1</sup> | 2 <sup>2</sup>  | .               | .               | .               | .               | .               | 2 <sup>1</sup>  | 1 <sup>2</sup> |
| <i>Polygonum lapathifolium</i> | .               | .               | 9 <sup>3</sup>  | 18 <sup>3</sup> | 5 <sup>3</sup>  | .               | 24 <sup>5</sup> | .               | .               | .              |
| <i>Falcaria vulgaris</i>       | .               | .               | 6 <sup>2</sup>  | .               | 10 <sup>2</sup> | .               | .               | .               | 6 <sup>3</sup>  | 1 <sup>2</sup> |
| <i>Viola tricolor</i>          | .               | .               | .               | .               | .               | 23 <sup>3</sup> | 12 <sup>8</sup> | 2 <sup>2</sup>  | 49 <sup>3</sup> | .              |
| <i>Melampyrum pratense</i>     | 39 <sup>2</sup> | 13 <sup>2</sup> | .               | .               | .               | .               | .               | 1 <sup>2</sup>  | .               | .              |
| <i>Salvia verticillata</i>     | 6 <sup>1</sup>  | .               | 1 <sup>1</sup>  | .               | .               | .               | .               | 4 <sup>1</sup>  | .               | .              |
| <i>Melilotus officinalis</i>   | .               | 13 <sup>1</sup> | 16 <sup>2</sup> | .               | 14 <sup>2</sup> | .               | .               | .               | .               | .              |
| <i>Juncus bufonius</i>         | .               | 25 <sup>2</sup> | 1 <sup>1</sup>  | .               | .               | .               | .               | 2 <sup>1</sup>  | .               | .              |
| <i>Arctium lappa</i>           | .               | .               | 1 <sup>1</sup>  | 18 <sup>1</sup> | .               | .               | .               | 1 <sup>1</sup>  | .               | .              |
| <i>Vicia villosa</i>           | .               | .               | 1 <sup>2</sup>  | 5 <sup>5</sup>  | .               | .               | .               | .               | .               | 2 <sup>2</sup> |
| <i>Plantago media</i>          | .               | .               | 27 <sup>2</sup> | .               | 5 <sup>5</sup>  | .               | .               | 5 <sup>2</sup>  | .               | .              |
| <i>Symphytum officinale</i>    | .               | .               | 3 <sup>1</sup>  | .               | .               | .               | .               | 5 <sup>1</sup>  | .               | 1 <sup>1</sup> |
| <i>Arabidopsis thaliana</i>    | .               | .               | .               | 9 <sup>2</sup>  | 10 <sup>2</sup> | .               | .               | .               | .               | 3 <sup>3</sup> |
| <i>Gypsophila muralis</i>      | .               | .               | .               | 36 <sup>3</sup> | .               | 62 <sup>5</sup> | 35 <sup>7</sup> | .               | .               | .              |
| <i>Polygonum amphibium</i>     | .               | .               | .               | .               | 5 <sup>3</sup>  | .               | .               | 2 <sup>1</sup>  | .               | 1 <sup>3</sup> |
| <i>Rubus caesius</i>           | .               | .               | .               | .               | .               | 23 <sup>5</sup> | 6 <sup>8</sup>  | .               | .               | 1 <sup>2</sup> |
| <i>Neslia paniculata</i>       | .               | .               | .               | .               | .               | .               | 12 <sup>6</sup> | 17 <sup>2</sup> | 1 <sup>2</sup>  | .              |

1. *Rhinantho-Avenetum fatuae*: 18 - PASSARGE, JURKO 1975, tab. 7, relevés 71,72, 94, 95, 98-111.
2. *Lathyro-Avenetum fatuae*: 8 - PASSARGE, JURKO 1975, tab. 7, relevés 74, 75, 77, 78, 92, 93, 96, 97.
3. *Lathyro tuberosi-Adonidetum aestivalis*: 9 - PASSARGE, JURKO 1975, tab. 7, relevés 1, 2, 5-10, 21; 25 - Stano 1980b; 37 - TONČIKOVÁ 1980; 19 - MOCHNACKÝ 1987.
4. *Consolido-Anthemidetum austriacae*: 12 - KROPÁČ, MOCHNACKÝ 1990, tab 1; 9 - KROPÁČ, MOCHNACKÝ 1990, tab. 3.
5. *Euphorbio exigue-Melandrietum noctiflori*: 11 - KRIPPELOVÁ 1981.
6. *Misopateto-Galeopsietum ladani*: 13 - KROPÁČ, HEJNÝ 1975.
7. *Consolido regalis-Misopatetum*: 17 - KROPÁČ, HEJNÝ 1975.
8. *Euphorbio helioscopiae-Veronicetum persicae*: 62 - PASSARGE, JURKO 1975, tab. 9, relevés 1-48, tab 10, relevés 2, 3, 4, 11-21; 48 - STANO 1980b.
9. *Setario viridis-Veronicetum politae*: 40 - STANO 1980b; 38 - VILČEKOVÁ 1981, tab. 1, relevés 1-20, tab. 2, relevés 1-18; 3 - MOCHNACKÝ 1987, tab 8, relevés 17-19; 26 - KRIPPELOVÁ ined. Borská rovina.
10. *Veronicetum trilobae-triphyllidi*: 10 - MOCHNACKÝ 1986; 70 - MOCHNACKÝ 1987; 37 - KRIPPELOVÁ ined. Borská rovina.

**Characteristic taxa:** *Agrostemma githago*, *Aethusa cynapium*, *Avena fatua*, *Buglossoides arvensis*, *Cyanus segetum*, *Euphorbia exigua*, *Galium tricornutum*, *Lathyrus tuberosus*, *Neslia paniculata*, *Papaver argemone*, *Sherardia arvensis*, *Veronica persica* (transgr.)

**Differential taxa:** *Stachys palustris*, *Trifolium arvense*, *T. campestre*, *Vicia angustifolia*, *Viola tricolor*

The communities of the order develop on basic to neutral substrata. They occur in the planar and colline belts and they penetrate into the submontane belts too. The development of the communities is conditioned and closely depends on the development of agricultural plants.

#### ***Caucalidion lappulae* R. Tx. 1950**

**Syn.:** *Secalinion medioeuropaeum* R. Tx. 1937 (articles 3f, 34), *Caucalidion lappulae* (*eurosibiricum*) R. Tx. 1950 (article 34), *Eu-Secalinion* SISSING & TIDEMAN 1960 (articles 3f, 34), *Camelinion microcarpae* RIES 1991 (articles 1, 5), *Caucalidion platycarpi* sensu auct. (article 30)

**Incl.:** *Triticenion* KRUSEMANN & VLIENER 1939 (article 30)

**Non.:** *Secalinion* BR.-BL. 1931 (articles 3f, 8), *Secalinion* BR.-BL. & al. 1936 (article 3f), *Secalinion mediterraneum* R. Tx. 1937 (articles 3f, 34)

**Tables** 1 and 2, columns 1-5

**Characteristic taxa:** *Adonis aestivalis*, *Ajuga chamaepitys*, *Anagallis foemina*, *Anthemis austriaca*, *Caucalis platycarpus*, *Galium tricornutum*, *Kickxia spuria*, *Neslia paniculata*, *Silene noctiflora* (transgr.)

**Differential taxa:** *Anthemis ruthenica*, *Veronica polita*, *Vicia sativa*

Thermophilous species with C<sub>4</sub> photosynthetic activity abound in the communities of the alliance *Caucalidion lappulae*. They develop in cereals, especially in winter crops. They occur on basic to neutral, sandy and loamy-sandy soils. They avoid waterlogged and heavy soils. The centre of their distribution lies in the warmest regions of Slovakia, they penetrate up to the submontane belts.

#### **1. *Rhinantho-Avenetum fatuae* PASSARGE in PASSARGE & Jurko 1975**

**Tables** 1 and 2, column 1

**Characteristic taxon:** *Rhinanthus alectorolophus*

**Differential taxon:** *Vicia cracca*

**Constantly accompanying taxa:** *Avena fatua*, *Campanula rapunculoides*, *Cirsium arvense*, *Convolvulus arvensis*, *Elytrigia repens*, *Fallopia convolvulus*, *Galeopsis tetrahit*, *Galium aparine*, *Lathyrus tuberosus*, *Mentha arvensis*, *Myosotis arvensis*, *Polygonum aviculare* agg., *Potentilla anserina*, *Sinapis arvensis*, *Sonchus arvensis*, *Stellaria media*, *Tussilago farfara*, *Veronica persica*, *Vicia angustifolia*, *V. cracca*, *V. hirsuta*

**Synmorphology:** The community forms two-layer stands in cereals. The upper layer consists of the species *Avena fatua*, *Convolvulus arvensis*, *Raphanus raphanistrum* and the lower one of the species *Mentha arvensis*, *Rhinanthus alectorolophus*, *Sherardia arvensis*, *Thlaspi arvense* and other.

**Synecology:** The community occurs in the submontane belt at altitude ca 650 - 800 m above sea level. It develops in the cereals (barley, oat) on skeletal soils. The sites are situated in moderately cold regions with the mean annual temperature 4-5 °C, the mean annual precipitation 700-1100 mm. The classification of the community into the association is problematic.

**Syndynamics:** It develops towards to the community *Spergulo arvensis-Scleranthetum annui* by the change of agricultural plants, and to the community *Echinochloo-Setarietum* in warmer regions.

**Synchorology:** There are records from Liptovská kotlina basin (PASSARGE, JURKO 1975 ; STANO 1980b), Popradská kotlina basin, Nízke Tatry Mts. and Pieniny Mts. (PASSARGE, JURKO 1975).

**Note:** There are endangered taxa in the community: *Agrostemma githago* (E,R) and *Lolium temulentum* (E). *Adonis aestivalis* (I), *Cyanus segetum* (I), *Gladiolus imbricatus* (V) and *Knautia kitaibellii* are vulnerable and more rare.

## 2. *Lathyro-Avenetum fatuae* PASSARGE in PASSARGE & JURKO 1975

Tables 1 and 2, column 2

**Differential taxa:** *Lathyrus pratensis*, *Valerianella locusta*

**Constantly accompanying taxa:** *Anagallis arvensis*, *Avena fatua*, *Cirsium arvense*, *Cyanus segetum*, *Euphorbia helioscopia*, *Fallopia convolvulus*, *Lathyrus tuberosus*, *Medicago lupulina*, *Mentha arvensis*, *Myosotis arvensis*, *Polygonum aviculare* agg., *Sherardia arvensis*, *Sinapis arvensis*, *Sonchus arvensis*, *Stellaria media*, *Veronica persica*, *Vicia angustifolia*, *V. hirsuta*

**Synmorphology:** It is a two-layer community in cereals. The upper layer is formed by the subdominant species *Chenopodium album*, *Convolvulus arvensis*, *Raphanus raphanistrum* and *Sinapis arvensis*. There are *Anthemis arvensis*, *Capsella bursa-pastoris* and *Myosotis arvensis* most frequent in the lower layer.

**Synecology:** The community occurs in winter crops (wheat, winter barley, rye) in fields at altitudes cca 500 - 800 m above s.l. Substrate is formed by skeletal, slightly acid to neutral brown soils and gley soils. The mean annual temperature is 5-7 °C.

**Syndynamics:** The change of seed-order in the growing of root crops during years (potatoes, beet) causes that the community *Lathyro-Avenetum fatuae* is replaced by the community *Lapsano-Veronicetum persicae*.

**Synchorology:** There are records for the community from the territory of Liptovská kotlina basin (PASSARGE, JURKO 1975, STANO 1980b), Oravská and Popradská kotlina basins (PASSARGE, JURKO 1975).

**Note:** From endangered species, we recorded only *Cyanus segetum* (I) in the community.

3. *Lathyro tuberosi-Adonidetum aestivalis* KROPÁČ & HADAČ in KROPÁČ, HADAČ & HEJNÝ 1971

**Non:** *Caucalido daucooidis-Scandicetum pecten-veneris* LIBBERT 1930

**Tables** 1 and 2, column 3

**Characteristic taxon:** *Adonis aestivalis*

**Constantly accompanying taxa:** *Elytrigia repens*, *Fallopia convolvulus*, *Lathyrus tuberosus*, *Polygonum aviculare* agg., *Tripleurospermum perforatum*, *Viola arvensis*

**Symmorphology:** The community *Lathyro tuberosi-Adonidetum aestivalis* forms two layers in the stands of cereals. The cereals reach the height of 80-100 cm. The weed community reach the height of 60-80 cm. The species, which characterize the physiognomy of the whole community occur in the upper layer. The dominant species *Cyanus segetum*, *Lathyrus tuberosus*, and *Sinapis arvensis* grow usually in groups. The size of the groups depends on the density and canopy of the agricultural plants, on edaphic conditions and on the extent of agrochemical and agrotechnical treatments. Only the single inflorescence of *Cirsium arvense*, *Sinapis arvensis* and *Tripleurospermum perforatum* overtop this level. The lower layer is formed by low herbs and less vital individuals of the upper layer of the community.

**Symphenology:** The development of the community, phenological phases, structural and coenotical expressions are conditioned and closely dependent on the development of the agricultural plants. In early spring months, in the spring agroecophase *Veronica hederifolia* finds favourable conditions in the community. *Lathyro tuberosi-Adonidetum aestivalis* has its optimum of the development in the summer agroecophase, in months June-July.

**Synecology:** The community occurs on moderately wavy plains and moderate slopes facing south and southeast in the planar and colline belts. It occurs in the sites, where oak-hornbeam forests grew in the past. It prefers especially chernozems, flood plain and brown soils on loess cover. It colonizes less frequently illimerized and alluvial soils. The soil reaction is slightly acid to neutral. The considerable change of soil-ecological conditions (melioration, frequent liming, deep tillage and others) forms favourable conditions for the thermophilous species of the alliance *Caucalidion lappulae*. Their occurrence and the optimal development of their life-processes are dependent on sufficient sun-heat and continental climate. Several geoelements of Pannonian flora with their northern border in the Východoslovenská rovina lowland are present in the community.

**Syndynamics:** The vegetative period of the community *Lathyro tuberosi-Adonidetum aestivalis* is finished by the harvest of the agricultural plants. Its floristic composition changes in the strongly disturbed sites mainly by the intensification of the agricultural wholesale production and so the community is more similar to the community *Euphorbio exigue-Melandrietum noctiflori* described in Germany ( HILBIG 1962; SCHUBERT, MAHN 1968 ).

**Syntaxonomy:** By the analysis of accessible material, we recorded some differences in the floristic composition of the community described by TONČÍKOVÁ (1980) from Slovenský kras karst. There are the calciphilous species *Galium tricornerutum*, *Neslia paniculata*, *Sherardia arvensis* in the community, replaced by species with wider ecological amplitude in other territories.

**Synchorology:** The community *Lathyro tuberosi-Adonidetum aestivalis* is of little distribution in Slovakia. KROPÁČ (1981,1983) reported the occurrence of the community from a warmer climatic area in a southern and south-eastern part of the territory in his reviews. There are phytocoenological records from the foot of the Malé Karpaty Mts. (PASSARGE, JURKO 1975), from Liptovská kotlina basin (STANO 1980b), Východoslovenská rovina lowland (MOCHNACKÝ 1984, 1987) and Slovenský kras karst (TONČÍKOVÁ 1980).

**Note:** *Lathyro tuberosi-Adonidetum aestivalis* is a retreading weed community also in Východoslovenská rovina lowland. It is due to the application of various herbicide and intensive agricultural practices. It is an immediately endangered association with a possibility of total disappearance. There are endangered and rare species in the association: *Adonis aestivalis* (I), *Cyanus segetum* (I), *Galium tricornerutum* (Vm), *Anagallis foemina*, *Kickxia elatine*, *Polycnemum arvense* and *Trifolium medium*.

#### 4. *Consolido-Anthemidetum austriacae* KROPÁČ & MOCHNACKÝ 1990

**Syn.:** *Consolido-Anthemidetum austriacae* KROPÁČ 1981 (article 2b), *Consolido-Anthemidetum austriacae* MOCHNACKÝ 1988 (articles 2b, 5)

**Non.:** *Anthemido austriacae-Consolidetum orientalis* SLAVNÍČ 1951, *Camelino microcarpae-Anthemidetum austriacae* HOLZNER 1973 nom. inv.

**Tables** 1 and 2, column 4

**Differential taxa:** *Caucalis platycarpus*, *Vicia pannonica*

**Constantly accompanying taxa:** *Consolida regalis*, *Stellaria media*, *Vicia hirsuta*, *Viola arvensis*

**Synmorphology:** The stands of the community *Consolido-Anthemidetum austriacae* consist mostly of three layers. Their height depends on the height of grown cereals and it is usually from 80 to 150 cm. Most phytomass is concentrated in the upper layer. It consists mostly of these species: *Apera spicita-venti*, *Avene fatua*, *Cyanus segetum*, *Fallopia convolvulus*, *Papaver rhoeas* and *Tripleurospermum perforatum* from the orders *Centaureetalia* and *Atriplici-Chenopodietalia*. The middle layer is formed by the diagnostically important species *Anthemis austriaca*, *Consolida regalis*, *Matricaria recutita*, *Silene noctiflora*, *Thlaspi arvense* and others. There are gaps and islets in the lower layer and the layer develops only in the spots, where site-conditions enable it. It is formed by the species: *Anagallis arvensis*, *Lamium amplexicaule*, *Medicago lupulina*, *Scleranthus annuus* and in the springtime *Veronica hederifolia*. Mushrooms *Agrocybe dura* (BOLT ex FR.) Sing and *Crucibulum laeve*

(HUDS. ex RELH) KAMBLY & al. have occurred seldom in the stands of the community in Východoslovenská rovina lowland.

**Symphonology:** The symphenological optimum of the community lies in the spring-summer agroecophase in June-July, when the dominant species are in full flowering phase. The fruit phase comes on in the second half of July and at the beginning of August. In that time, most stands become extinct as a result of the harvest and can persist only in a fragmentary form in the field margins.

**Synecology:** The community prefers the sites with light soils on clay substrate. It refers sandy, loamy-sandy and sandy-loamy soils with an insignificant amount of calcium ions, skeletal soils. The soil reaction is slightly acid to neutral. The occurrence of the community is limited to the original sites of the communities belonging to the alliance *Carpinion betuli* (MICHALKO & al. 1986). The sites of the community are plains, moderately wavy plains, and slopes facing the south and southeast, those with whole day's sunshine, half-dry to xerothermic. The stands are optimally developed mostly in the cereal-hides margins and in the places where they can utilize suitable conditions as a result of the low vitality and canopy of the cereals.

**Syndynamics:** From the syngenetic view, the community *Consolido-Anthemidetum austriacae* develops in the sites of the winter-spring ephemeral community *Veronicetum trilobae-triphyllidi*, which is replaced in the summer agroecophase.

**Syntaxonomy:** The authors have distinguished two subassociations and six variants:

(1) *Consolido-Anthemidetum austriacae anthemidetosum* KROPÁČ & MOCHNACKÝ 1990

The community has not got own differential taxa and it is distinguished negatively from the next subassociation. It is limited to middle heavy to sandy-loamy soils with a high admixture of calcium-free gravel and stones. Three variants are described within the subassociation. The typical variant with a rather high presence of species belonging to the alliance *Caucalidion*, known only from the Czech republic for the present; the variant with *Vicia grandiflora* and the variant with *Vicia pannonica*, both known from Východoslovenská rovina lowland.

(2) *Consolido-Anthemidetum austriacae trifolietosum arvensis* KROPÁČ & MOCHNACKÝ 1990

**Differential taxa:** *Conyza canadensis*, *Setaria viridis*, *Trifolium arvense*

The community occurs on loamy-sandy to sandy carbonate-free soils. The variability of the community is reflected in three variants. The typical variant includes the stands which are the richest in species; the variant with *Gypsophila muralis* is poorer in species and with a rather high amount of species belonging to the class *Isoëto-Nanojuncetea* in the sites occasionally inundated with water and the variant with *Anthemis ruthenica* from sandy soils.

**Synchorology:** The community is distributed in the planar and colline belts, in warm to moderately warm climatic region (KROPÁČ 1981). It is rare in Slovakia and its occurrence is concentrated mostly in the southern and south-eastern part.

There are records from Borská rovina lowland, Ipeľská pahorkatina hills and Východoslovenská rovina lowland (KROPÁČ, MOCHNACKÝ 1990).

**Note:** It is a rare and endangered community with endangered and rare species *Cyanus segetum* (I), *Kickxia elatine* (I), *Anthemis ruthenica* and *Logfia arvensis*.

#### 5. *Euphorbio exigue-Melandrietum noctiflori* G. MÜLLER 1964

**Syn.:** *Papaveri-Melandrietum* WASSCHER 1941 (article 3b), *Lathyro-Melandrietum* OBERD. 1957 (article 3b), *Melandrietum noctiflori* LANG 1973 (article 29), *Euphorbio exigue-Silenetum noctiflorae* (G. MÜLLER 1964) HOLZNER 1973 (article 30)

**Tables** 1 and 2, column 5

**Differential taxa:** *Ajuga chamaepitys*, *Anagallis foemina*, *Caucalis platycarpos*, *Euphorbia falcata*, *E. platyphylos*, *Kickxia spuria*, *Matricaria recutita*

**Constantly accompanying taxa:** *Chenopodium album*, *Cirsium arvense*, *Consolida regalis*, *Convolvulus arvensis*, *Cyanus segetum*, *Fallopia convolvulus*, *Raphanus raphanistrum*, *Stachys annua*

**Synmorphology:** The community forms two-layer stands in cereals. The species like *Apera spica-venti*, *Papaver rhoeas*, *Silene noctiflora* predominate in the upper layer. The prostrate species *Ajuga chamaepitys*, *Anagallis foemina*, *Euphorbia exigua*, *Kickxia spuria* and others grow in the lower layer.

**Synecology:** The community occurs on carbonate skeletal soils, on rendzina, in slopes and it prefers the slopes facing the south and east. The soils are of a high content of calcium, they become dry and they are airy. The community occurs in winter crops and in spring cereals.

**Syndynamics:** The amount of the species belonging to the alliance *Panico-Setarion* showing a high cover value of the species *Euphorbia falcata*, *Setaria pumila*, *S. viridis*, and *Sonchus arvensis* increases by the change of cereals for root crops.

**Synchorology:** There are records for the association *Euphorbio exigue-Melandrietum noctiflori* only from Slovenský kras karst and Košická kotlina basin (KRIPPELOVÁ 1981). The centre of the area lies in lowlands and hill-lands of middle Europe.

**Note:** It is a rare and by agrotechnical treatments endangered community. Several endangered species occur in the community: *Adonis aestivalis* (I), *Bromus secalinus* (Vm), *Caucalis platycarpos* (V), *Cyanus segetum* (I), *Galium tricorutum* (Vm), *Kickxia spuria* (I), *Melampyrum barbatum* (V) and *Misopates orontium* (I). The species considered to be more rare are: *Anagallis foemina*, *Anthemis ruthenica*, *Papaver argemone*, *Sideritis montana* and *Xanthium strumarium*.

### **Sherardion KROPÁČ & HEJNÝ in KROPÁČ 1978**

**Syn.:** *Sherardion* KROPÁČ & HEJNÝ 1975 (article 3b).

**Tables** 1 and 2, columns 6-7

**Characteristic taxa:** *Aethusa cynapium* subsp. *agrestis* (transgr.), *Galium spurium*, *Geranium dissectum*, *Kickxia elatine*, *Misopates orontium*, *Valerianella dentata*

**Differential taxa:** *Daucus carota*, *Filago arvensis*, *Lepidium campestre*

In the alliance *Sherardion*, weed communities occurring in the stands of cereals in the colline belts are present. They occur in the stands of winter crops, especially those of winter barley, wheat and rye.

Acid to slightly basic brown soils form substrata. The climate is subcontinental with the mean annual precipitation of 700-900 mm and temperature 6-7 °C. They arose in the sites, where oak-hornbeam forests would potentially grow. The alliance is represented by two associations, *Consolido regalis-Misopatetum* and *Misopateto-Galeopsietum ladani*. Another community from the alliance *Sherardion*, *Aethuso-Galeopsietum* G. MÜLLER 1964 published by KROPÁČ and HEJNÝ from Bohemia and Moravia (KROPÁČ, HEJNÝ 1975; KROPÁČ 1981), has not been found in Slovakia so far.

### **6. Misopateto-Galeopsietum ladani HEJNÝ in KROPÁČ & HEJNÝ 1975**

**Tables** 1 and 2, column 6

**Characteristic taxa:** *Galeopsis ladanum* (dom.), *Geranium dissectum*

**Differential taxa:** *Agrostis stolonifera*, *Aphanes arvensis*, *Knautia arvensis*, *Lotus corniculatus*

**Constantly accompanying taxa:** *Achillea millefolium* agg., *Aethusa cynapium* subsp. *agrestis*, *Agrostis stolonifera*, *Anagallis arvensis*, *Anthemis arvensis*, *Cirsium arvense*, *Convolvulus arvensis*, *Daucus carota*, *Elytrigia repens*, *Euphorbia exigua*, *Fallopia convolvulus*, *Kickxia elatine*, *Linaria vulgaris*, *Mentha arvensis*, *Misopates orontium*, *Myosotis arvensis*, *Plantago lanceolata*, *P. major*, *Polygonum aviculare* agg., *Ranunculus repens*, *Scleranthus annuus*, *Setaria pumila*, *Sherardia arvensis*, *Spergula arvensis*, *Stachys palustris*, *Trifolium arvense*, *T. campestre*, *T. pratense*, *Veronica persica*, *Viola arvensis*

**Synmorphology:** The community consists of two-layer stands, which are rich in species (the average number of taxa per relevé is amounted up to 44). There are species *Cirsium arvense*, *Convolvulus arvensis*, *Raphanus raphanistrum* and *Tripleurospermum perforatum* in the upper, usually thin layer. The substantial part of phytomass represented mostly by other species is concentrated in the lower, more closed layer.

**Synecology:** The community *Misopateto-Galeopsietum ladani* has got optimal conditions in the stands of winter crops, respectively in stubble-fields after the cereals (rye, wheat, barley) in the colline belts 250-500 m a. s. l. The fields (often private ones) are slightly to strong sloping. The soils are calcium-free, clay-loamy



to sandy-loamy, differently gley, acid. They belong to a moderately warm and moderately humid to humid climatic region, with the mean annual temperature 6-7 °C and the mean annual precipitation of 700-900mm. The sites were originally overgrown with forests probably belonging to the association *Carici pilosae-Carpinetum* (MICHALKO & al. 1986).

**Syndynamics:** By the change of cereals for root crops, the community *Trifolio arvensis-Scleranthum annui* arises in the sites.

**Syntaxonomy:** The association includes two subassociations:

(1) *Misopateto-Galeopsietum ladani typicum* HEJNÝ in KROPÁČ & HEJNÝ 1975

(2) *Misopateto-Galeopsietum ladani trifolietosum arvensis* HEJNÝ in KROPÁČ & HEJNÝ 1975 with the typical variant and with the variant with *Viola tricolor*.

**Synchorology:** There are records for the community from Ondavská vrchovina hills in north-eastern Slovakia (KROPÁČ, HEJNÝ 1975).

**Note:** The community is rare and endangered in Slovakia. There are several endangered and more rare taxa there: *Agrostemma githago* (E, R), *Aphanes arvensis* (I), *Cyanus segetum* (I), *Kickxia elatine* (I), *Misopates orontium* (I) and *Logfia arvensis*.

#### 7. *Consolida regalis-Misopatetum* KROPÁČ in KROPÁČ & HEJNÝ 1975

**Syn.:** *Kickxio elatine-Misopatetum orontii* KROPÁČ 1974 (article 3b)

**Tables** 1 and 2, column 7

**Differential taxa:** *Sonchus asper*, *Spergularia rubra*, *Valerianella rimosa*

**Differential taxa opposite to *Misopateto-Galeopsietum ladani*:** *Avena fatua*, *Cichorium intybus*, *Consolida regalis*, *Setaria viridis*, *Sonchus asper*, *Rumex crispus*, *Veronica arvensis*

**Constantly accompanying taxa:** *Misopates orontium* (dom.), *Anagallis arvensis*, *Anthemis arvensis*, *Atriplex patula*, *Chenopodium album*, *Cirsium arvense*, *Consolida regalis*, *Convolvulus arvensis*, *Cyanus segetum*, *Euphorbia exigua*, *Fallopia convolvulus*, *Kickxia elatine*, *Medicago lupulina*, *Myosotis arvensis*, *Polygonum aviculare* agg., *Scleranthus annuus*, *Spergula arvensis*, *Tripleurospermum perforatum*, *Veronica persica*, *Viola arvensis*

**Synmorphology:** It is a community very rich in species, with the average number of taxa per relevé 40. It forms two layers in the stands of cereals. The upper one reaches the height of 100-140 cm and there are the species there: *Avena fatua*, *Cirsium arvense*, *Cyanus segetum*, *Raphanus raphanistrum*, *Tripleurospermum perforatum*. Most species occur in the lower layer. Besides the diagnostic species, the species *Medicago lupulina*, *Setaria pumila* and *Stellaria media* occur more frequently.

**Synecology:** The community occurs in the winter crops (barley, wheat, rye) at altitudes of 200-500 m above s.l., in a moderately warm (cca 8 °C), moderately humid to humid climatic region. Soils are usually typical brown, minerally grey, slightly acid to acid, loamy-sandy to sandy-loamy, often with a high admixture of

gravel and stones. Young eruptives (andesite tuff) or mezozoic slates are parental materials.

**Syndynamics:** The stands occur in the places where forest communities with the dominant trees *Quercus cerris*, *Q. petraea*, *Carpinus betulus* grew. As a result of the change of agricultural plants for e.g. root crops, the community is replaced by the community *Spergulo arvensis-Scleranthetum annui*.

**Syntaxonomy:** *Consolido regalis-Misopatetum* includes two subassociations:

(1) *Consolido regalis-Misopatetum trifolietosum arvensis* KROPÁČ in KROPÁČ & HEJNÝ 1975

**Differential taxa:** *Gypsophila muralis*, *Spergularia rubra*, *Trifolium arvense*  
The community is limited to light loamy-sandy soils.

(2) *Consolido regalis-Misopatetum lathyretosum tuberosi* KROPÁČ in KROPÁČ & HEJNÝ 1975

**Differential taxon:** *Lathyrus tuberosus*  
The community occurs on rather heavy soils.

**Synchorology:** The center of the distribution lies in the south of the middle Slovakia. There are records from Burda, Štiavnické vrchy Mts., Ipeľská pahorkatina hills, Krupinská planina, Ipeľská kotlina basin, Slovenský kras karst, Revúcka vrchovina hills and Vihorlat Mts. (KROPÁČ, HEJNÝ 1975).

**Note:** It is a rare community with the species requiring attention and the more rare species *Cyanus segetum* (I), *Kickxia elatine* (I), *Misopates orontium* (I) and *Logfia arvensis* occur occasionally.

#### **Veronico-Euphorbion** SISSINGH ex PASSARGE 1964

**Syn.:** *Veronico-Euphorbion* SISSINGH 1942 (article 1), *Veronico-Euphorbion* KNAPP 1971 (article 8, 29)

**Syntax. syn.:** *Fumario-Euphorbion* T. MÜLLER in GÖRS 1966, *Veronico politae-Taraxacion* KROPÁČ & HADAČ in KROPÁČ & al. 1971

**Tables** 1 and 2, columns 8-10

**Characteristic taxon:** *Lamium purpureum*

**Differential taxon:** *Geranium pusillum*

The communities of the alliance *Veronico-Euphorbion* are the segetal communities from the stands of root crops and special agricultural plants (vineyards). They occur in the potato-sugar beet type from lowlands to submontane belts. Brown soils and illimerized alluvial soils are the substrate in this sites. Early in the springtime they occur in lowlands and they form a spring ephemeral aspect with *Gagea pratensis*, *Holosteum umbellatum*, *Lamium amplexicaule*, *L. purpureum* and *Ornithogalum boucheanum*.

**Note:** T. KRIPPELOVÁ described the community *Lamio amplexicaule-Thlaspietum arvensis* in the 1981. This community has not been confirmed by the synthesis of the alliance from 394 phytocoenological reléves. The diagnostic taxa asserted in

the original diagnosis, *Lamium amplexicaule* and *Thlaspi arvensis* seem to be the species of the higher syntaxa and the table does not contain other differential taxa.

**8. *Euphorbio helioscopiae-Veronicetum persicae* PASSARGE in PASSARGE & JURKO 1975 em. JAROLÍMEK & al. 1997**

**Syntax. syn.:** *Lapsano-Veronicetum persicae* PASSARGE in PASSARGE & JURKO 1975, *Thlaspio-Euphorbietum helioscopiae* TONČIKOVÁ 1980 (article 1), *Thlaspio-Euphorbietum helioscopiae* TONČIKOVÁ in MUCINA & MAGLOCKÝ 1985 (article 2b)

**Pseudonym:** „*Setario-Fumarietum officinalis*” sensu PASSARGE in PASSARGE & JURKO 1975, „*Thlaspio-Fumarietum officinalis*” sensu PASSARGE in PASSARGE & JURKO 1975

**Non.:** *Setario-Fumarietum officinalis* J.TX. 1955, *Thlaspio-Fumarietum officinalis* GÖRS 1966

**Nomenclatural note:** The emendation of the name refers to the uniting of two associations (*Euphorbio helioscopiae-Veronicetum persicae* and *Lapsano-Veronicetum persicae*) described in the same publication (PASSARGE, JURKO 1975).

**Tables** 1 and 2, column 8

**Constantly accompanying taxa:** *Chenopodium album*, *Cirsium arvense*, *Elytrigia repens*, *Fallopia convolvulus*, *Galeopsis tetrahit*, *Galium aparine*, *Medicago lupulina*, *Mentha arvensis*, *Myosotis arvensis*, *Sonchus arvensis*, *Stachys palustris*, *Stellaria media*, *Veronica persica*, *Viola arvensis*

**Synmorphology:** The association occurs in the stands of root crops. By less favourable climatic conditions it can be found also in the stands of winter crops. The community consists of two-layer stands. The species *Cirsium arvense*, *Elytrigia repens*, *Galeopsis tetrahit* and *Veronica persica* are the dominant species and the edificators at the same time.

**Synecology:** The community arises on neutral to alkalic substrata. The soils are rich in nutriments, they are skeletal with a low sorptional complex.

**Syndynamics:** By the change of agricultural plants during the turning of the ecoagrophases, the community *Euphorbio helioscopiae-Veronicetum politae* is replaced by the community *Lathyro tuberosi-Adonidetum aestivalis*.

**Synchorology:** The association is of a wide ecological amplitude. It is distributed from planar to submontane belts. In Slovakia, there are records from Trábeč Mts. (ELIÁŠ 1984b), Slovenský kras karst (TONČIKOVÁ 1980), Volovské vrchy Mts., Veľká Fatra Mts., Podtatranská brázda, Liptovská, Hornádska, Popradská kotlina basins (PASSARGE, JURKO 1975).

**Note:** Endangered species are represented in the community only by the species: *Cyanus segetum* (I) and *Gladiolus imbricatus* (V).

9. *Setario viridis-Veronicetum politae* OBERD. 1957

**Non:** *Mercurialetum annuae* KRUSEMAN & VIEGER 1939 (article 3b), *Thlaspio-Veronicetum politae* GÖRS 1966

**Tables** 1 and 2, column 9

**Characteristic taxon:** *Veronica polita* (transgr.)

**Differential taxa:** *Cerastium brachypetalum*, *Mercurialis annua*, *Senecio vulgaris*

**Constantly accompanying taxa:** *Capsella bursa-pastoris*, *Cirsium arvense*, *Convolvulus arvensis*, *Lamium amplexicaule*, *L. purpureum*, *Sinapis arvensis*, *Stellaria media*, *Veronica persica*

**Synmorphology:** It is a community rich in species, with a high representation of the species belonging to the class *Stellarietea mediae*. The stands consist of two layers with dominant and subdominant species like *Capsella bursa-pastoris*, *Cirsium arvense*, *Conyza canadensis*, *Lamium amplexicaule* and *Stellaria media*.

**Synecology:** It is a community of submontane to montane belts growing in the stands of root crops, in a moderately cold to cold climatic region, the potato-type. Soils are represented by luvisol, the soil reaction is slightly basic to acid.

**Synchorology:** In the territory of Slovakia, it occurs dispersed, the centre of its occurrence is in Liptovská kotlina basin (STANO 1980b). There are records from Podunajská rovina lowland, Trnavská pahorkatina hills, Malé Karpaty Mts. (VILČEKOVÁ 1981).

**Syntaxonomical note:** KROPÁČ (1981) recorded also *Amarantho-Fumarietum* J.Tx. 1955 in Slovakia, but he admitted that the relationship of this association to *Setario-Fumarietum* J. Tx. 1955 and *Setario-Veronicetum* OBERD. 1957 should be solved. The original diagnosis of *Amarantho-Fumarietum* contains the species *Amaranthus lividus*, *Digitaria sanguinalis*, *Euphorbia peplus*, *Portulaca oleracea*, *Setaria pumila* and *S. verticillata*, which confirm, that *Setario viridis-Veronicetum politae* according to the original diagnosis (OBERDORFER 1957) and our phyto-coenological material cannot be identified with the association *Amarantho-Fumarietum*. The last mentioned type probably does not occur in Slovakia.

**Note:** The endangered species are represented in the community by the species *Misopates orontium* (I) and *Galium cornutum* (Vm).

10. *Veronicetum trilobae-triphyllidi* SLAVNIČ 1951

**Syn.:** *Veronicetum trilobae-triphyllidi* SLAVNIČ 1944 (article 1), „*Veronicetum hederifolio-triphyllidi* SLAVNIČ 1951“ sensu auct. (article 30), *Consolido-Veronicetum* Kropáč 1981 (article 2b)

**Tables** 1 and 2, column 10

**Characteristic taxa:** *Veronica hederifolia* (dom.), *V. triphyllos*

**Differential taxa:** *Gagea pratensis*, *Holostem umbelatum*, *Veronica triloba*, *V. verna*

**Constantly accompanying taxa:** *Stellaria media* (dom.), *Capsella bursa-pastoris*, *Lamium amplexicaule*

**Synmorphology:** The community is formed by low ephemeral species with the height of 0.5-15 cm, the species from the families *Scrophulariaceae* and *Brassicaceae* dominate. Heliophilous and thermophilous species prevail in the species composition of the community. The community *Veronicetum trilobae-triphyllidi* is richer in species than other ephemeral communities. It is caused by its early spring development, when agrotechnical and agrochemical treatments are minimal. That is the reason for its occurrence in the stands of agricultural plants with various agroecological and agrotechnical claims. That is reflected in the species composition of the community, too. The species of the order *Centaureetalia cyani* predominate in cereals and those of the order *Atriplici-Chenopodietalia albi*, of the class *Stellarietea mediae*, and *Sedo-Scleranthetea* predominate in vineyards. The species belonging to the classes *Polygono-Poetea annuae*, *Molinio-Arrhenatheretea* and *Artemisietea vulgaris* are represented less.

**Symphenology:** The optimum of the development of the community lies in the spring agroecophase in April to May, when the dominant species are in full flowering phase. At the beginning of June, the fruiting phase comes on.

**Synecology:** The stands of the association occur in the stands of cereals and in vineyards. They colonize places facing south and southeast on sandy, loamy-sandy and sandy-loamy soils with calcium. Their occurrence is limited to the neutral to slightly acid soils. In some places, the association is well developed in sand dunes. It occurs in the places where the communities of the alliance *Carpinion betuli* grew before.

**Syndynamics:** The species composition is formed in the summer agroecophase in such way that the species of the alliance *Caucalidion lappulae* and those of the order *Centaureetalia cyani* become dominant instead of ephemeral species. New coenotical combinations are formed and weed communities classified to the association *Consolido-Anthemidetum austriacae* in cereals arise. In vineyards, the stands of the subassociation *Veronicetum trilobae-triphyllidi holosteetosum* are replaced by the community *Portulacetum oleraceae*.

**Syntaxonomy:** Community includes two subassociations:

(1) *Veronicetum trilobae-triphyllidi typicum* JAROLÍMEK & al. 1997

**Differential taxa:** *Consolida regalis*, *Glechoma hederacea*, *Thlaspi arvense*, *Viola arvensis*

The subassociation occurs in the stands of cereals, especially those of winter wheat.

(2) *Veronicetum trilobae-triphyllidi holosteetosum* JAROLÍMEK & al. 1997

**Differential taxa:** *Arabidopsis thaliana*, *Buglossoides arvensis*, *Conyza canadensis*, *Erophila verna*, *Gagea pratensis*, *Holosteum umbellatum*, *Ornithogalum boucheanum*, *Veronica verna*.

The floristic composition of the subassociation is enriched by spring ephemeral therophytes and spring geophytes. It occurs in vineyards, in slopes facing south

and southeast on sands in the southern part of Východoslovenská rovina lowland.

**Synchorology:** The community is recorded from Borská rovina and Podunajská rovina lowlands (KRIPPELOVÁ ined.), Východoslovenská rovina lowland (MOCHNACKÝ 1986), where it reaches into the northern margin of its area. It is floristically poorer in the northern margin of the Pannonian region than in the southern part.

**Note :** It is a rare community endangered by agriculture, the furrowing and recultivation of sand dunes. There are several endangered species in the community: *Agrostemma githago* (E, R), *Androsace maxima* (E, R), *Cyanus segetum* (I), *Myosurus minimus* (V) and *Ornithogalum boucheanum* (Vm). More rare species are represented by *Papaver argemone*, *P. dubium* agg. and *Veronica triloba*.

### ***Atriplici-Chenopodietalia albi* R. TX. ( 1937 ) NORDHAGEN 1940**

Weed communities on less nutritious loose soils

**Syn:** *Arvetalia* RÜBEL 1933 p. p. min. (article 8, 34), *Chenopodietalia medio-europea* R. TX. 1937 (article 34), *Lolio-Linetalia* J. et R. TX. in J. TX. 1966 (article 8), *Spergularietalia arvensis* HUPPE & HOFMEISTER 1990 (article 5, 29), *Polygono-Chenopodietalia* sensu auct. (article 29)

**Syntax. syn.:** *Secali-Violetalia arvensis* BR.-BL. & R. TX. ex SISSINGH in WESTHOF & al. 1946 p. p. min., *Atriplici-Chenopodietalia albi* R. TX. (1937) 1950, *Aperetalia spica-venti* J. & R. TX. in MALATO-BELIZ & al. 1960, *Stachyetalia annuae* RIES 1991 p. p. (article 1, 5)

**Non:** *Chenopodietalia albi* BR.-BL. 1931 (article 8), *Chenopodietalia mediterranea* R. TX. 1937 (article 34)

**Tables** 1 and 3, columns 11-18

**Characteristic taxa:** *Apera spica-venti*, *Chenopodium polyspermum*, *Spergula arvensis*, *Veronica agrestis*

They are the therophyte communities with the centre of their occurrence in the stands of root crops and special agricultural stands (vineyards, vegetables, sunflowers). The agricultural technology - sowing, planting out in the springtime, and tilling are important presumptions of their development. Species with ruderal strategy predominate. They are distributed on various neutral to acid substrata in all Slovakia. In rather cold Carpathian area, they can be found in the stands of cereals, too. The order *Chenopodietalia* is distinguished from the order *Centaureetalia* mainly by the absence of many characteristic and differential species of the order *Centaureetalia*. The own diagnostic species are nitrophilous, without claims to warmth. The species with a wide ecological amplitude and subatlantic distribution are abundant. The order includes the alliances *Scleranthion annui*, *Spergulo-Oxalidion* and *Panico-Setarion*.

**Table 3. Synoptic table of the order *Atriplici-Chenopodietalia albi***

11. *Spergulo arvensis-Scleranthetum annui*
12. *Myosotido-Sonchetum arvensis*
13. *Aphano arvensis-Matricarietum chamomillae*
14. *Cannabido ruderalis-Silenetum noctiflorae*
15. *Erophilo-Arabidopsietum*
16. *Panico-Chenopodietum polyspermi*
17. *Echinochloo-Setarietum viridis*
18. *Stachyo annui-Setarietum pumilae*

| Column                           | 11  | 12                     | 13                     | 14                      | 15                     | 16                     | 17                     | 18                     |
|----------------------------------|-----|------------------------|------------------------|-------------------------|------------------------|------------------------|------------------------|------------------------|
| Number of relevés                | 52  | 60                     | 53                     | 15                      | 18                     | 74                     | 206                    | 38                     |
| Average number of species        | 28  | 26                     | 17                     | 20                      | 7                      | 21                     | 16                     | 19                     |
| <i>Galeopsis bifida</i>          | D11 | <b>67</b> <sup>2</sup> | 2 <sup>2</sup>         | .                       | .                      | .                      | 3 <sup>3</sup>         | .                      |
| <i>Stachys palustris</i>         | D11 | <b>62</b> <sup>3</sup> | 38 <sup>2</sup>        | .                       | .                      | .                      | 5 <sup>3</sup>         | 4 <sup>2</sup>         |
| <i>Stellaria graminea</i>        | D11 | <b>48</b> <sup>2</sup> | 5 <sup>2</sup>         | .                       | .                      | .                      | 3 <sup>2</sup>         | .                      |
| <i>Agrostis gigantea</i>         | D11 | <b>44</b> <sup>3</sup> | 2 <sup>3</sup>         | .                       | .                      | .                      | .                      | .                      |
| <i>Vicia cracca</i>              | D11 | <b>44</b> <sup>2</sup> | .                      | .                       | .                      | .                      | .                      | .                      |
| <i>Vicia sepium</i>              | D11 | <b>29</b> <sup>2</sup> | .                      | .                       | .                      | .                      | .                      | .                      |
| <i>Rhinanthus alectorolophus</i> | D11 | <b>27</b> <sup>3</sup> | .                      | .                       | .                      | .                      | .                      | .                      |
| <i>Lathyrus pratensis</i>        | D11 | <b>27</b> <sup>2</sup> | .                      | .                       | .                      | .                      | .                      | .                      |
| <i>Veronica agrestis</i>         | D12 | .                      | <b>75</b> <sup>4</sup> | 30 <sup>3</sup>         | .                      | .                      | 5 <sup>2</sup>         | 12 <sup>3</sup>        |
| <i>Tussilago farfara</i>         | D12 | .                      | <b>67</b> <sup>2</sup> | .                       | .                      | .                      | .                      | 1 <sup>1</sup>         |
| <i>Lamium album</i>              | D12 | .                      | <b>43</b> <sup>3</sup> | .                       | .                      | .                      | .                      | 3 <sup>2</sup>         |
| <i>Chamomilla recutita</i>       | D13 | .                      | .                      | <b>100</b> <sup>3</sup> | .                      | .                      | 5 <sup>2</sup>         | 4 <sup>2</sup>         |
| <i>Fumaria vaillantii</i>        | D13 | .                      | .                      | <b>11</b> <sup>3</sup>  | .                      | .                      | .                      | .                      |
| <i>Cannabis ruderalis</i>        | C14 | .                      | .                      | .                       | <b>53</b> <sup>4</sup> | .                      | .                      | .                      |
| <i>Conyza canadensis</i>         | D14 | .                      | .                      | .                       | <b>73</b> <sup>3</sup> | .                      | 20 <sup>2</sup>        | 11 <sup>2</sup>        |
| <i>Lactuca serriola</i>          | D14 | .                      | .                      | 6 <sup>2</sup>          | <b>67</b> <sup>2</sup> | .                      | 7 <sup>2</sup>         | 4 <sup>2</sup>         |
| <i>Melandrium noctiflorum</i>    | D14 | .                      | .                      | 30 <sup>2</sup>         | <b>67</b> <sup>3</sup> | .                      | .                      | 1 <sup>1</sup>         |
| <i>Lycopsis arvensis</i>         | D14 | 2 <sup>1</sup>         | .                      | 19 <sup>2</sup>         | <b>40</b> <sup>2</sup> | .                      | .                      | .                      |
| <i>Erophila verna</i>            | D15 | .                      | .                      | .                       | 7 <sup>1</sup>         | <b>57</b> <sup>4</sup> | .                      | .                      |
| <i>Malva neglecta</i>            | D18 | .                      | .                      | .                       | .                      | .                      | .                      | 2 <sup>1</sup>         |
| <i>Urtica urens</i>              | D18 | .                      | .                      | .                       | .                      | .                      | .                      | 2 <sup>1</sup>         |
| <i>Euphorbia exigua</i>          | D18 | .                      | .                      | .                       | .                      | .                      | .                      | 2 <sup>2</sup>         |
| <i>Stachys annua</i>             | D19 | .                      | .                      | .                       | 13 <sup>2</sup>        | .                      | 11 <sup>4</sup>        | 5 <sup>1</sup>         |
| <i>Ajuga chamaepitys</i>         | D19 | .                      | .                      | .                       | .                      | .                      | .                      | <b>76</b> <sup>4</sup> |
| <b><i>Scleranthion annui</i></b> |     |                        |                        |                         |                        |                        |                        | <b>24</b> <sup>3</sup> |
| <i>Rumex acetosella</i>          | D   | <b>38</b> <sup>3</sup> | 10 <sup>1</sup>        | 9 <sup>1</sup>          | .                      | .                      | 1 <sup>2</sup>         | .                      |
| <i>Agrostis capillaris</i>       | D   | <b>35</b> <sup>2</sup> | 2 <sup>2</sup>         | .                       | .                      | .                      | .                      | .                      |
| <i>Campanula rapunculoides</i>   | D   | <b>23</b> <sup>2</sup> | 2 <sup>1</sup>         | .                       | .                      | .                      | .                      | .                      |
| <i>Arabidopsis thaliana</i>      | D   | .                      | .                      | 19 <sup>2</sup>         | <b>47</b> <sup>3</sup> | <b>47</b> <sup>4</sup> | .                      | .                      |
| <i>Aphanes arvensis</i>          | D   | .                      | .                      | 17 <sup>2</sup>         | .                      | 3 <sup>2</sup>         | .                      | 1 <sup>1</sup>         |
| <b><i>Spergulo-Oxalidion</i></b> |     |                        |                        |                         |                        |                        |                        |                        |
| <i>Oxalis fontana</i>            | C   | 6 <sup>2</sup>         | .                      | 17 <sup>2</sup>         | .                      | .                      | <b>65</b> <sup>3</sup> | 5 <sup>2</sup>         |
| <i>Chenopodium polyspermum</i>   | tC  | .                      | 5 <sup>2</sup>         | .                       | .                      | .                      | <b>85</b> <sup>3</sup> | 19 <sup>2</sup>        |
| <i>Euphorbia peplus</i>          | C   | .                      | .                      | 6 <sup>2</sup>          | .                      | .                      | <b>26</b> <sup>2</sup> | .                      |

Tab. 3. continued (1)

|                                  |   |                 |                 |                 |                 |                 |                 |                                 |
|----------------------------------|---|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|---------------------------------|
| <b>Panico-Setarion</b>           |   |                 |                 |                 |                 |                 |                 |                                 |
| <i>Fumaria officinalis</i>       | D | .               | .               | .               | .               | .               | .               | 2 <sup>2</sup> 5 <sup>3</sup>   |
| <i>Reseda lutea</i>              | D | .               | .               | .               | .               | .               | .               | 1 <sup>2</sup> 8 <sup>2</sup>   |
| <i>Diplotaxis muralis</i>        | D | .               | .               | .               | .               | .               | .               | 1 <sup>2</sup> 8 <sup>2</sup>   |
| <i>Datura stramonium</i>         | D | .               | .               | .               | .               | .               | .               | 3 <sup>2</sup> 8 <sup>2</sup>   |
| <i>Mercurialis annua</i>         | D | .               | .               | .               | .               | .               | .               | 1 <sup>3</sup> 8 <sup>4</sup>   |
| <i>Anagallis foemina</i>         | D | .               | .               | .               | .               | .               | .               | 1 <sup>2</sup> 8 <sup>2</sup>   |
| <i>Setaria verticillata</i>      | D | .               | .               | .               | .               | .               | .               | 1 <sup>5</sup> 8 <sup>3</sup>   |
| <i>Ballota nigra</i>             | D | .               | .               | .               | .               | .               | .               | 1 <sup>2</sup> 3 <sup>1</sup>   |
| <i>Falcaria vulgaris</i>         | D | .               | .               | .               | .               | .               | .               | 2 <sup>1</sup> 5 <sup>3</sup>   |
| <b>Atriplici-Chenopodietalia</b> |   |                 |                 |                 |                 |                 |                 |                                 |
| <i>Raphanus raphanistrum</i>     |   | 69 <sup>2</sup> | 95 <sup>3</sup> | 40 <sup>2</sup> | 73 <sup>2</sup> | 7 <sup>3</sup>  | 32 <sup>2</sup> | 19 <sup>2</sup> 32 <sup>4</sup> |
| <i>Vicia hirsuta</i>             |   | 54 <sup>3</sup> | 48 <sup>2</sup> | 45 <sup>2</sup> | 60 <sup>2</sup> | 3 <sup>2</sup>  | 9 <sup>3</sup>  | 6 <sup>2</sup> 3 <sup>2</sup>   |
| <i>Anthemis arvensis</i>         |   | 44 <sup>2</sup> | 20 <sup>3</sup> | 25 <sup>2</sup> | .               | 17 <sup>4</sup> | 19 <sup>4</sup> | 9 <sup>2</sup> 29 <sup>3</sup>  |
| <i>Vicia tetrasperma</i>         |   | 12 <sup>2</sup> | .               | 40 <sup>2</sup> | 47 <sup>2</sup> | .               | 19 <sup>2</sup> | 7 <sup>2</sup> 3 <sup>2</sup>   |
| <i>Scleranthus annuus</i>        |   | 54 <sup>3</sup> | 38 <sup>3</sup> | .               | .               | 23 <sup>6</sup> | 43 <sup>4</sup> | 6 <sup>3</sup> 42 <sup>5</sup>  |
| <i>Apera spica-venti</i>         |   | 12 <sup>3</sup> | 2 <sup>3</sup>  | 42 <sup>3</sup> | .               | .               | 11 <sup>2</sup> | 3 <sup>3</sup> 5 <sup>4</sup>   |
| <i>Galinsoga parviflora</i>      |   | 2 <sup>1</sup>  | .               | 11 <sup>4</sup> | .               | .               | 38 <sup>4</sup> | 58 <sup>6</sup> 37 <sup>4</sup> |
| <i>Spergula arvensis</i>         |   | 63 <sup>2</sup> | 68 <sup>3</sup> | .               | .               | .               | 8 <sup>4</sup>  | 6 <sup>2</sup> 8 <sup>4</sup>   |
| <i>Solanum nigrum</i>            |   | .               | .               | .               | .               | .               | 5 <sup>3</sup>  | 13 <sup>2</sup> 5 <sup>2</sup>  |
| <b>Centaureetalia cyani</b>      |   |                 |                 |                 |                 |                 |                 |                                 |
| <i>Papaver rhoeas</i>            |   | .               | .               | 42 <sup>2</sup> | 13 <sup>2</sup> | .               | .               | 5 <sup>1</sup> 5 <sup>2</sup>   |
| <i>Ranunculus arvensis</i>       |   | .               | .               | 34 <sup>2</sup> | .               | 10 <sup>2</sup> | 5 <sup>2</sup>  | 1 <sup>4</sup> .                |
| <i>Agrostemma githago</i>        |   | 12 <sup>2</sup> | .               | .               | .               | .               | .               | .                               |
| <i>Vicia villosa</i>             |   | 2 <sup>2</sup>  | .               | .               | 4 <sup>.2</sup> | .               | 4 <sup>3</sup>  | . 3 <sup>2</sup>                |
| <i>Buglossoides arvensis</i>     |   | .               | .               | .               | .               | 13 <sup>2</sup> | 1 <sup>2</sup>  | 1 <sup>2</sup> .                |
| <i>Aethusa cynapium</i>          |   | 4 <sup>1</sup>  | .               | .               | .               | .               | 5 <sup>3</sup>  | 1 <sup>1</sup> 18 <sup>3</sup>  |
| <i>Silene gallica</i>            |   | 2 <sup>1</sup>  | .               | .               | .               | .               | .               | .                               |
| <i>Vicia pannonica</i>           |   | .               | .               | .               | .               | .               | 1 <sup>3</sup>  | .                               |
| <b>Eragrostietalia</b>           |   |                 |                 |                 |                 |                 |                 |                                 |
| <i>Echinochloa crus-galli</i>    |   | .               | .               | 19 <sup>2</sup> | .               | .               | 77 <sup>4</sup> | 89 <sup>5</sup> 50 <sup>5</sup> |
| <i>Setaria viridis</i>           |   | 2 <sup>2</sup>  | .               | .               | .               | .               | 22 <sup>5</sup> | 20 <sup>2</sup> 66 <sup>4</sup> |
| <i>Setaria pumila</i>            |   | .               | .               | .               | .               | .               | 47 <sup>5</sup> | 56 <sup>3</sup> 87 <sup>6</sup> |
| <i>Digitaria ischaemum</i>       |   | 2 <sup>5</sup>  | .               | .               | .               | .               | 9 <sup>3</sup>  | 1 <sup>3</sup> 13 <sup>3</sup>  |
| <i>Amaranthus lividus</i>        |   | .               | .               | 2 <sup>2</sup>  | .               | .               | .               | 8 <sup>2</sup> .                |
| <i>Digitaria sanguinalis</i>     |   | .               | .               | .               | 20 <sup>3</sup> | .               | .               | 3 <sup>2</sup> .                |
| <i>Portulaca oleracea</i>        |   | .               | .               | .               | 7 <sup>1</sup>  | .               | .               | 6 <sup>3</sup> .                |
| <i>Hibiscus trionum</i>          |   | .               | .               | .               | .               | .               | 3 <sup>5</sup>  | 12 <sup>2</sup> .               |
| <i>Eragrostis minor</i>          |   | .               | .               | .               | .               | .               | 1 <sup>2</sup>  | 1 <sup>2</sup> .                |
| <i>Polycnemum arvense</i>        |   | 2 <sup>2</sup>  | .               | .               | .               | .               | .               | .                               |
| <i>Amaranthus albus</i>          |   | .               | .               | .               | .               | .               | .               | 1 <sup>4</sup> .                |
| <i>Amaranthus blitoides</i>      |   | .               | .               | .               | .               | .               | .               | 1 <sup>1</sup> .                |
| <i>Cynodon dactylon</i>          |   | .               | .               | .               | .               | .               | .               | 1 <sup>1</sup> .                |
| <i>Salsola australis</i>         |   | .               | .               | .               | .               | .               | .               | 5 <sup>5</sup>                  |
| <b>Stellarietea mediae</b>       |   |                 |                 |                 |                 |                 |                 |                                 |
| <i>Stellaria media</i>           |   | 62 <sup>3</sup> | 92 <sup>4</sup> | 60 <sup>3</sup> | 87 <sup>3</sup> | 33 <sup>3</sup> | 39 <sup>4</sup> | 43 <sup>3</sup> 16 <sup>3</sup> |



Tab. 3. continued (2)

|                                  |                 |                 |                 |                  |                 |                 |                 |                 |
|----------------------------------|-----------------|-----------------|-----------------|------------------|-----------------|-----------------|-----------------|-----------------|
| <i>Capsella bursa-pastoris</i>   | 19 <sup>2</sup> | 30 <sup>2</sup> | 72 <sup>2</sup> | 87 <sup>2</sup>  | 60 <sup>4</sup> | 58 <sup>3</sup> | 48 <sup>3</sup> | 37 <sup>3</sup> |
| <i>Chenopodium album</i>         | 13 <sup>2</sup> | 73 <sup>3</sup> | 53 <sup>2</sup> | 100 <sup>3</sup> | 7 <sup>3</sup>  | 89 <sup>3</sup> | 86 <sup>3</sup> | 87 <sup>5</sup> |
| <i>Matricaria perforata</i>      | 40 <sup>2</sup> | 97 <sup>5</sup> | 72 <sup>3</sup> | 100 <sup>2</sup> | 60 <sup>4</sup> | 70 <sup>4</sup> | 69 <sup>3</sup> | 26 <sup>3</sup> |
| <i>Fallopia convolvulus</i>      | 60 <sup>3</sup> | 95 <sup>5</sup> | 57 <sup>3</sup> | 67 <sup>2</sup>  | .               | 30 <sup>3</sup> | 25 <sup>3</sup> | 50 <sup>4</sup> |
| <i>Anagallis arvensis</i>        | 31 <sup>2</sup> | 25 <sup>2</sup> | 21 <sup>2</sup> | 13 <sup>2</sup>  | .               | 42 <sup>3</sup> | 20 <sup>2</sup> | 42 <sup>3</sup> |
| <i>Viola arvensis</i>            | 63 <sup>2</sup> | 78 <sup>2</sup> | 74 <sup>3</sup> | .                | 47 <sup>4</sup> | 32 <sup>3</sup> | 11 <sup>2</sup> | 16 <sup>3</sup> |
| <i>Lamium amplexicaule</i>       | 2 <sup>1</sup>  | 5 <sup>2</sup>  | 9 <sup>2</sup>  | .                | 27 <sup>3</sup> | 30 <sup>2</sup> | 12 <sup>2</sup> | 8 <sup>2</sup>  |
| <i>Consolida regalis</i>         | 6 <sup>2</sup>  | .               | 77 <sup>3</sup> | 73 <sup>2</sup>  | 23 <sup>3</sup> | 4 <sup>2</sup>  | 2 <sup>1</sup>  | 8 <sup>4</sup>  |
| <i>Sinapis arvensis</i>          | .               | 42 <sup>2</sup> | 51 <sup>2</sup> | 13 <sup>2</sup>  | 7 <sup>3</sup>  | 32 <sup>3</sup> | 12 <sup>2</sup> | 37 <sup>4</sup> |
| <i>Thlaspi arvense</i>           | .               | 3 <sup>2</sup>  | 68 <sup>3</sup> | 13 <sup>2</sup>  | 23 <sup>2</sup> | 24 <sup>3</sup> | 14 <sup>2</sup> | 3 <sup>1</sup>  |
| <i>Myosotis arvensis</i>         | 71 <sup>2</sup> | 78 <sup>2</sup> | 38 <sup>2</sup> | 20 <sup>2</sup>  | 30 <sup>3</sup> | 19 <sup>3</sup> | 9 <sup>2</sup>  | .               |
| <i>Sonchus arvensis</i>          | 60 <sup>3</sup> | 73 <sup>2</sup> | 19 <sup>2</sup> | .                | .               | 31 <sup>3</sup> | 17 <sup>2</sup> | 21 <sup>4</sup> |
| <i>Sonchus asper</i>             | 2 <sup>2</sup>  | 2 <sup>1</sup>  | 13 <sup>2</sup> | .                | .               | 18 <sup>3</sup> | 13 <sup>2</sup> | 24 <sup>4</sup> |
| <i>Sonchus oleraceus</i>         | 4 <sup>2</sup>  | 3 <sup>3</sup>  | .               | 13 <sup>2</sup>  | .               | 26 <sup>3</sup> | 23 <sup>2</sup> | 34 <sup>3</sup> |
| <i>Atriplex patula</i>           | 2 <sup>2</sup>  | 2 <sup>1</sup>  | .               | 13 <sup>2</sup>  | .               | 1 <sup>2</sup>  | 8 <sup>2</sup>  | 3 <sup>3</sup>  |
| <i>Centaurea cyanus</i>          | 23 <sup>2</sup> | 25 <sup>1</sup> | .               | .                | 13 <sup>6</sup> | 28 <sup>3</sup> | 9 <sup>1</sup>  | 24 <sup>3</sup> |
| <i>Veronica persica</i>          | 35 <sup>2</sup> | 45 <sup>3</sup> | .               | .                | 13 <sup>2</sup> | 46 <sup>3</sup> | 11 <sup>3</sup> | 34 <sup>4</sup> |
| <i>Lamium purpureum</i>          | .               | 37 <sup>2</sup> | 25 <sup>2</sup> | .                | 10 <sup>2</sup> | 18 <sup>3</sup> | 16 <sup>2</sup> | .               |
| <i>Lathyrus tuberosus</i>        | .               | 32 <sup>3</sup> | 45 <sup>3</sup> | .                | .               | 28 <sup>3</sup> | 9 <sup>2</sup>  | 26 <sup>3</sup> |
| <i>Amaranthus retroflexus</i>    | .               | .               | 4 <sup>2</sup>  | 7 <sup>1</sup>   | .               | 26 <sup>3</sup> | 64 <sup>3</sup> | 39 <sup>3</sup> |
| <i>Veronica arvensis</i>         | 27 <sup>2</sup> | 8 <sup>2</sup>  | .               | .                | 3 <sup>2</sup>  | 1 <sup>3</sup>  | 3 <sup>3</sup>  | .               |
| <i>Avena fatua</i>               | 4 <sup>2</sup>  | 17 <sup>2</sup> | .               | .                | .               | 1 <sup>2</sup>  | 5 <sup>2</sup>  | .               |
| <i>Euphorbia helioscopia</i>     | 10 <sup>2</sup> | 48 <sup>2</sup> | .               | .                | .               | .               | 13 <sup>2</sup> | 8 <sup>2</sup>  |
| <i>Veronica hederifolia</i> agg. | .               | 7 <sup>3</sup>  | 26 <sup>3</sup> | .                | 30 <sup>3</sup> | .               | 2 <sup>2</sup>  | 3 <sup>2</sup>  |
| <i>Veronica polita</i>           | .               | .               | .               | .                | 7 <sup>3</sup>  | 1 <sup>3</sup>  | 2 <sup>2</sup>  | 8 <sup>3</sup>  |
| <i>Galeopsis tetrahit</i>        | 94 <sup>3</sup> | 80 <sup>3</sup> | .               | .                | .               | 3 <sup>3</sup>  | 8 <sup>3</sup>  | .               |
| <i>Mentha arvensis</i>           | 73 <sup>3</sup> | 60 <sup>3</sup> | .               | .                | .               | 1 <sup>3</sup>  | 8 <sup>3</sup>  | .               |
| <i>Sherardia arvensis</i>        | 21 <sup>2</sup> | .               | .               | .                | .               | 7 <sup>3</sup>  | 2 <sup>3</sup>  | 11 <sup>4</sup> |
| <i>Medicago sativa</i>           | .               | .               | .               | 47 <sup>2</sup>  | .               | 9 <sup>3</sup>  | 2 <sup>3</sup>  | 5 <sup>2</sup>  |
| <i>Kickxia elatine</i>           | 4 <sup>3</sup>  | .               | .               | .                | .               | .               | 3 <sup>2</sup>  | .               |
| <i>Senecio vulgaris</i>          | .               | 8 <sup>2</sup>  | .               | 7 <sup>1</sup>   | .               | .               | 1 <sup>2</sup>  | .               |
| <i>Descurainia sophia</i>        | .               | .               | 9 <sup>2</sup>  | 33 <sup>2</sup>  | .               | .               | 1 <sup>1</sup>  | .               |
| <i>Camelina microcarpa</i>       | .               | .               | 6 <sup>2</sup>  | .                | .               | 1 <sup>3</sup>  | 1 <sup>2</sup>  | .               |
| <i>Amaranthus chlorostachys</i>  | .               | .               | .               | .                | 7 <sup>3</sup>  | 1 <sup>2</sup>  | 6 <sup>2</sup>  | .               |
| <i>Euphorbia falcata</i>         | .               | .               | .               | .                | .               | 4 <sup>4</sup>  | 1 <sup>1</sup>  | 13 <sup>3</sup> |
| <i>Misopates orontium</i>        | .               | .               | .               | .                | .               | 7 <sup>2</sup>  | 1 <sup>1</sup>  | 5 <sup>3</sup>  |
| <i>Kickxia spuria</i>            | .               | .               | .               | .                | .               | 5 <sup>3</sup>  | 1 <sup>2</sup>  | 3 <sup>3</sup>  |
| <i>Chenopodium hybridum</i>      | .               | .               | .               | .                | .               | 1 <sup>5</sup>  | 5 <sup>2</sup>  | 11 <sup>5</sup> |
| <i>Galeopsis ladanum</i>         | 2 <sup>1</sup>  | .               | .               | .                | .               | 1 <sup>2</sup>  | .               | .               |
| <i>Chenopodium vulvaria</i>      | .               | 2 <sup>2</sup>  | .               | .                | .               | .               | 1 <sup>4</sup>  | .               |
| <i>Xanthium strumarium</i>       | .               | .               | .               | .                | .               | 1 <sup>3</sup>  | 3 <sup>2</sup>  | .               |
| <i>Atriplex oblongifolia</i>     | .               | .               | .               | .                | .               | 4 <sup>4</sup>  | .               | 16 <sup>4</sup> |
| <i>Viola tricolor</i>            | 19 <sup>2</sup> | .               | .               | .                | .               | .               | .               | .               |
| <i>Neslia paniculata</i>         | 6 <sup>2</sup>  | .               | .               | .                | .               | .               | .               | .               |
| <i>Bromus arvensis</i>           | 2 <sup>1</sup>  | .               | .               | .                | .               | .               | .               | .               |
| <i>Geranium dissectum</i>        | .               | 5 <sup>2</sup>  | .               | .                | .               | .               | .               | .               |

Tab. 3. continued (3)

|                                 |                 |                 |                 |                 |                 |                 |                 |                 |
|---------------------------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| <i>Stachys arvensis</i>         | .               | 3 <sup>3</sup>  | .               | .               | .               | .               | .               | .               |
| <i>Lepidium densiflorum</i>     | .               | .               | .               | 7 <sup>1</sup>  | .               | .               | .               | .               |
| <i>Myosotis stricta</i>         | .               | .               | .               | .               | 3 <sup>2</sup>  | .               | .               | .               |
| <i>Anthemis austriaca</i>       | .               | .               | .               | .               | .               | 1 <sup>2</sup>  | .               | .               |
| <i>Bromus secalinus</i>         | .               | .               | .               | .               | .               | 1 <sup>2</sup>  | .               | .               |
| <i>Consolida orientalis</i>     | .               | .               | .               | .               | .               | 1 <sup>2</sup>  | .               | .               |
| <i>Malva sylvestris</i>         | .               | .               | .               | .               | .               | .               | 5 <sup>1</sup>  | .               |
| <i>Chenopodium strictum</i>     | .               | .               | .               | .               | .               | .               | 2 <sup>2</sup>  | .               |
| <i>Atriplex tatarica</i>        | .               | .               | .               | .               | .               | .               | 2 <sup>2</sup>  | .               |
| <i>Malva pusilla</i>            | .               | .               | .               | .               | .               | .               | 1 <sup>2</sup>  | .               |
| <i>Hyoscyamus niger</i>         | .               | .               | .               | .               | .               | .               | 1 <sup>1</sup>  | .               |
| <i>Amaranthus bouchonii</i>     | .               | .               | .               | .               | .               | .               | .               | 8 <sup>2</sup>  |
| <i>Fumaria rostellata</i>       | .               | .               | .               | .               | .               | .               | .               | 3 <sup>3</sup>  |
| <b>Other taxa</b>               |                 |                 |                 |                 |                 |                 |                 |                 |
| <i>Cirsium arvense</i>          | 71 <sup>3</sup> | 72 <sup>2</sup> | 30 <sup>2</sup> | 13 <sup>3</sup> | 7 <sup>3</sup>  | 55 <sup>3</sup> | 49 <sup>2</sup> | 84 <sup>4</sup> |
| <i>Convolvulus arvensis</i>     | 27 <sup>2</sup> | 58 <sup>2</sup> | 64 <sup>2</sup> | 73 <sup>2</sup> | 13 <sup>3</sup> | 47 <sup>3</sup> | 42 <sup>3</sup> | 82 <sup>4</sup> |
| <i>Equisetum arvense</i>        | 27 <sup>2</sup> | 33 <sup>2</sup> | 57 <sup>2</sup> | 20 <sup>3</sup> | 3 <sup>1</sup>  | 35 <sup>3</sup> | 32 <sup>3</sup> | 18 <sup>3</sup> |
| <i>Achillea millefolium</i>     | 58 <sup>2</sup> | 35 <sup>2</sup> | 6 <sup>2</sup>  | 33 <sup>1</sup> | .               | 11 <sup>2</sup> | 8 <sup>1</sup>  | 8 <sup>2</sup>  |
| <i>Elytrigia repens</i>         | 56 <sup>2</sup> | 55 <sup>5</sup> | 62 <sup>3</sup> | 80 <sup>2</sup> | .               | 42 <sup>4</sup> | 30 <sup>3</sup> | 34 <sup>4</sup> |
| <i>Trifolium repens</i>         | 25 <sup>3</sup> | 10 <sup>2</sup> | .               | 33 <sup>2</sup> | 13 <sup>3</sup> | 39 <sup>3</sup> | 12 <sup>2</sup> | 21 <sup>3</sup> |
| <i>Taraxacum officinale</i>     | 21 <sup>2</sup> | 23 <sup>2</sup> | .               | 40 <sup>2</sup> | 23 <sup>2</sup> | 27 <sup>2</sup> | 30 <sup>2</sup> | 11 <sup>3</sup> |
| <i>Erodium cicutarium</i>       | 8 <sup>2</sup>  | 33 <sup>2</sup> | 4 <sup>3</sup>  | 33 <sup>3</sup> | .               | .               | 8 <sup>2</sup>  | 29 <sup>3</sup> |
| <i>Galium aparine</i>           | 58 <sup>3</sup> | 83 <sup>4</sup> | 28 <sup>2</sup> | .               | .               | 7 <sup>2</sup>  | 14 <sup>2</sup> | 3 <sup>3</sup>  |
| <i>Filaginella uliginosa</i>    | 42 <sup>2</sup> | 23 <sup>2</sup> | 15 <sup>2</sup> | .               | .               | 20 <sup>3</sup> | 11 <sup>2</sup> | 8 <sup>3</sup>  |
| <i>Polygonum persicaria</i>     | 37 <sup>2</sup> | 72 <sup>3</sup> | 6 <sup>2</sup>  | .               | .               | 34 <sup>3</sup> | 25 <sup>2</sup> | 26 <sup>3</sup> |
| <i>Poa annua</i>                | 15 <sup>2</sup> | 3 <sup>2</sup>  | .               | 33 <sup>2</sup> | 3 <sup>3</sup>  | 16 <sup>2</sup> | 10 <sup>2</sup> | .               |
| <i>Medicago lupulina</i>        | 8 <sup>2</sup>  | 43 <sup>2</sup> | .               | 13 <sup>3</sup> | .               | 7 <sup>3</sup>  | 7 <sup>2</sup>  | 18 <sup>2</sup> |
| <i>Arenaria serpyllifolia</i>   | 4 <sup>2</sup>  | .               | .               | 33 <sup>4</sup> | 3 <sup>2</sup>  | 12 <sup>3</sup> | 3 <sup>2</sup>  | 13 <sup>2</sup> |
| <i>Glechoma hederacea</i>       | 17 <sup>2</sup> | 2 <sup>2</sup>  | 9 <sup>2</sup>  | .               | .               | 1 <sup>3</sup>  | 3 <sup>2</sup>  | .               |
| <i>Trifolium arvense</i>        | 10 <sup>2</sup> | 12 <sup>2</sup> | .               | 13 <sup>2</sup> | .               | 5 <sup>2</sup>  | 1 <sup>1</sup>  | 11 <sup>2</sup> |
| <i>Trifolium pratense</i>       | 6 <sup>2</sup>  | 15 <sup>2</sup> | .               | 13 <sup>2</sup> | .               | 12 <sup>2</sup> | 4 <sup>2</sup>  | .               |
| <i>Polygonum aviculare</i> agg. | 56 <sup>2</sup> | 95 <sup>3</sup> | .               | 53 <sup>2</sup> | .               | 38 <sup>3</sup> | 24 <sup>3</sup> | 16 <sup>3</sup> |
| <i>Rumex crispus</i>            | 29 <sup>2</sup> | 10 <sup>1</sup> | .               | .               | 3 <sup>1</sup>  | 4 <sup>2</sup>  | 11 <sup>2</sup> | .               |
| <i>Rorippa sylvestris</i>       | 17 <sup>3</sup> | 2 <sup>3</sup>  | .               | .               | .               | 35 <sup>2</sup> | 16 <sup>2</sup> | 5 <sup>3</sup>  |
| <i>Melandrium album</i>         | 15 <sup>2</sup> | 20 <sup>2</sup> | .               | .               | .               | 1 <sup>2</sup>  | 8 <sup>2</sup>  | 8 <sup>3</sup>  |
| <i>Polygonum tomentosum</i>     | 15 <sup>2</sup> | 2 <sup>2</sup>  | .               | .               | 22 <sup>3</sup> | 1 <sup>2</sup>  | 12 <sup>2</sup> | 29 <sup>3</sup> |
| <i>Artemisia vulgaris</i>       | .               | 3 <sup>1</sup>  | .               | 53 <sup>2</sup> | .               | 15 <sup>2</sup> | 7 <sup>2</sup>  | 8 <sup>2</sup>  |
| <i>Lapsana communis</i>         | 44 <sup>2</sup> | 35 <sup>2</sup> | .               | .               | .               | 3 <sup>2</sup>  | 4 <sup>2</sup>  | .               |
| <i>Ranunculus repens</i>        | 35 <sup>2</sup> | 5 <sup>2</sup>  | .               | .               | .               | 8 <sup>2</sup>  | 5 <sup>2</sup>  | .               |
| <i>Plantago lanceolata</i>      | 2 <sup>2</sup>  | .               | .               | .               | .               | 4 <sup>2</sup>  | 4 <sup>2</sup>  | 3 <sup>1</sup>  |
| <i>Plantago media</i>           | .               | 47 <sup>2</sup> | .               | .               | .               | 22 <sup>4</sup> | .               | 8 <sup>3</sup>  |
| <i>Polygonum lapathifolium</i>  | .               | .               | 8 <sup>3</sup>  | .               | .               | 24 <sup>2</sup> | 28 <sup>2</sup> | 5 <sup>2</sup>  |
| <i>Arctium tomentosum</i>       | .               | .               | 6 <sup>1</sup>  | .               | 7 <sup>2</sup>  | 5 <sup>3</sup>  | 6 <sup>2</sup>  | .               |
| <i>Gypsophila muralis</i>       | .               | .               | .               | 27 <sup>3</sup> | .               | 34 <sup>3</sup> | 19 <sup>2</sup> | 24 <sup>4</sup> |
| <i>Erysimum cheiranthoides</i>  | .               | .               | .               | .               | 3 <sup>3</sup>  | 5 <sup>2</sup>  | 3 <sup>1</sup>  | 3 <sup>2</sup>  |
| <i>Lolium temulentum</i>        | 10 <sup>2</sup> | 13 <sup>2</sup> | 2 <sup>3</sup>  | .               | .               | .               | 2 <sup>1</sup>  | .               |

Tab. 3. continued (4)

|                              |                 |                 |                |                 |                 |                 |                 |                 |
|------------------------------|-----------------|-----------------|----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| <i>Poa pratensis</i>         | 6 <sup>2</sup>  | 2 <sup>3</sup>  | .              | 20 <sup>2</sup> | .               | .               | 1 <sup>4</sup>  | .               |
| <i>Dactylis glomerata</i>    | 2 <sup>2</sup>  | 7 <sup>2</sup>  | .              | 20 <sup>1</sup> | .               | .               | 1 <sup>1</sup>  | .               |
| <i>Symphytum officinale</i>  | 8 <sup>2</sup>  | 15 <sup>1</sup> | .              | .               | .               | 7 <sup>2</sup>  | 3 <sup>2</sup>  | .               |
| <i>Linaria vulgaris</i>      | 12 <sup>2</sup> | 5 <sup>2</sup>  | .              | .               | .               | .               | 3 <sup>2</sup>  | .               |
| <i>Plantago major</i>        | 8 <sup>2</sup>  | .               | 6 <sup>2</sup> | 47 <sup>2</sup> | .               | 47 <sup>3</sup> | 28 <sup>2</sup> | .               |
| <i>Polygonum nodosum</i>     | 12 <sup>2</sup> | .               | .              | .               | .               | 4 <sup>2</sup>  | 5 <sup>2</sup>  | .               |
| <i>Bidens tripartita</i>     | 6 <sup>2</sup>  | .               | .              | .               | .               | 16 <sup>2</sup> | 7 <sup>2</sup>  | 3 <sup>2</sup>  |
| <i>Cardaria draba</i>        | .               | .               | 2 <sup>2</sup> | .               | 3 <sup>2</sup>  | .               | 6 <sup>2</sup>  | .               |
| <i>Cichorium intybus</i>     | .               | .               | .              | .               | .               | 8 <sup>2</sup>  | 6 <sup>1</sup>  | 11 <sup>3</sup> |
| <i>Chaenorrhinum minus</i>   | .               | .               | .              | .               | .               | 3 <sup>3</sup>  | 1 <sup>2</sup>  | 5 <sup>3</sup>  |
| <i>Potentilla anserina</i>   | 44 <sup>2</sup> | 75 <sup>2</sup> | .              | .               | .               | .               | 5 <sup>2</sup>  | .               |
| <i>Vicia angustifolia</i>    | 38 <sup>2</sup> | 37 <sup>2</sup> | .              | .               | .               | .               | 1 <sup>1</sup>  | .               |
| <i>Polygonum hydropiper</i>  | 33 <sup>3</sup> | .               | .              | .               | .               | 3 <sup>3</sup>  | 1 <sup>2</sup>  | .               |
| <i>Trifolium campestre</i>   | 23 <sup>3</sup> | .               | .              | .               | .               | 9 <sup>3</sup>  | .               | 16 <sup>2</sup> |
| <i>Leucanthemum vulgare</i>  | 15 <sup>2</sup> | .               | .              | .               | .               | 1 <sup>3</sup>  | 1 <sup>1</sup>  | .               |
| <i>Juncus bufonius</i>       | 12 <sup>3</sup> | .               | .              | .               | .               | 8 <sup>3</sup>  | 1 <sup>3</sup>  | .               |
| <i>Chamomilla suaveolens</i> | .               | 23 <sup>2</sup> | .              | 12 <sup>2</sup> | 18 <sup>3</sup> | .               | .               | .               |
| <i>Pastinaca sativa</i>      | .               | 3 <sup>1</sup>  | .              | .               | .               | 3 <sup>3</sup>  | 4 <sup>2</sup>  | .               |
| <i>Chenopodium glaucum</i>   | .               | .               | .              | .               | .               | 1 <sup>2</sup>  | 3 <sup>2</sup>  | .               |
| <i>Daucus carota</i>         | .               | .               | .              | .               | .               | 8 <sup>3</sup>  | 4 <sup>2</sup>  | 11 <sup>3</sup> |
| <i>Lythrum hyssopifolia</i>  | .               | .               | .              | .               | .               | 9 <sup>3</sup>  | 2 <sup>2</sup>  | 3 <sup>5</sup>  |
| <i>Spergularia rubra</i>     | .               | .               | .              | .               | .               | 5 <sup>4</sup>  | 2 <sup>2</sup>  | 5 <sup>4</sup>  |

***Scleranthion annui* ( Kruseman & Vlieger 1939 ) Sissingh in Vesthoff & al. 1946**

**Syn.:** *Agrostion spicae-venti* R. Tx. 1947 (article 29), *Agrostion spica-venti* R. Tx. in OBERD. 1949 (article 29), *Aphanion arvensis* J. et R. Tx. in MALATO-BELIZ & al. 1960 (article 29), *Viola arvensis-Scleranthetum* PASSARGE in PASSARGE & JURKO 1975 p. p. (article 3b), *Aperion spicae-venti* sensu auct. (article 30)

**Incl.:** *Scleranthion annui* KRUSEMAN & VLIEGER 1939, *Aphanenion arvensis* (J. & R. Tx. in MALATO-BELIZ & al. 1960) OBERD. 1983

**Tables** 1 and 3, columns 11–15

**Characteristic taxa:** *Aphanes arvensis*, *Spergula arvensis*

**Differential taxa:** *Agrostis capillaris*, *Arabidopsis thaliana*, *Campanula rapunculoides*, *Galeopsis tetrahit*, *Lycopsis arvensis*, *Matricaria discoidea*, *Rumex acetosella*

The communities of the alliance *Scleranthion annui* occur in the stands of cereals, root crops and special agricultural plants in all Slovakia. They occur on sandy to loamy-sandy light substrata, on luvisol, illimerized alluvial soils, which are basic to acid. They are situated in humid to mesophilous sites. The optimum of their development is in the maize and the sugar-beet type. Various site conditions are reflected in a wide species spectrum and in a considerable diversity of the communities within the alliance.

### 11. *Spergulo arvensis-Scleranthetum annui* KUHN 1937

**Syn.:** *Galeopsio-Aphanetum* (OBERD. 1957) MEISEL 1962 (article 29), *Spergulo-Raphanetum* KROPÁČ 1981 (article 2b)

**Syntax. syn.:** *Galeopsio-Matricarietum chamomillae* OBERD. 1957, *Holco-Galeopsietum* HILBIG 1965, *Alchemillo-Sonchetum arvensis* PASSARGE in PASSARGE & JURKO 1975

**Tables** 1 and 3, column 11

**Differential taxa:** *Agrostis capillaris*, *A. gigantea*, *Campanula rapunculoides*, *Galeopsis bifida*, *Lathyrus pratensis*, *Rumex acetosella*, *Stachys palustris*, *Stellaria graminea*, *Vicia cracca*, *V. sepium*

**Constantly accompanying taxa:** *Cirsium arvense*, *Cyanus segetum*, *Fallopia convolvulus*, *Galeopsis tetrahit*, *Mentha arvensis*, *Myosotis arvensis*, *Raphanus raphanistrum*, *Scleranthus annuus*, *Sonchus arvensis*, *Spergula arvensis*, *Stellaria media*, *Vicia hirsuta*, *Viola arvensis*

**Synmorphology:** The community occurs in the stands of cereals where it forms two layers. The upper one consists of the species *Apera spica-venti*, *Fallopia convolvulus* and *Raphanus raphanistrum*. The species *Galeopsis tetrahit*, *Phleum pratense*, *Rhinanthus alectorolophus*, *Trifolium arvense* and *Viola tricolor* are added by in turns according to microrelief and climatic conditions. The characteristic species of the community, joined by the species *Euphorbia peplus*, *Lamium purpureum* and *L. amplexicaule* are in the lower layer.

**Synecology:** The community occurs mostly on acid brown forest soils at altitudes cca 500-800 m a. s. l. The mean annual temperature varies from 2 to 5°C, the mean annual precipitation is 800-1000mm.

**Syntaxonomy:** PASSARGE, JURKO (1975) distinguished two subassociations in the community: *typicum* and *scleranthetosum annui*.

**Synchorology:** The community is recorded from Liptovská kotlina basin (PASSARGE, JURKO 1975; STANO 1980b), Volovské vrchy Mts., Skorušinské vrchy Mts., Horehronské podolie, Oravská kotlina basin, Podtatranská brázda, Hornádska kotlina basin, Slovenský raj Mts., Spišská Magura Mts., Levočské vrchy Mts. (PASSARGE, JURKO 1975).

**Note:** There are several endangered species in the community: *Agrostemma githago* (E, R), *Cyanus segetum* (I), *Gladiolus imbricatus* (V), *Kickxia elatine* (I), *Lolium temulentum* (E), *Silene gallica* (Vm) and *Viola palustris* (V). More rare species are represented by *Bromus secalinus*, *Psylidium arenarium*, *Polycnemum arvense* and *Trifolium medium*.

### 12. *Myosotido-Sonchetum arvensis* PASSARGE in PASSARGE & JURKO 1975

**Syn.:** *Viola arvensis-Scleranthetum* PASSARGE in PASSARGE & JURKO 1975 p. p. (article 3b), *Galeopsio-Scleranthetum* STANO 1980 (article 1)

**Tables** 1 and 3, column 12

**Differential taxa:** *Lamium album*, *Tussilago farfara*, *Veronica agrestis*

**Constantly accompanying taxa:** *Cirsium arvense*, *Chenopodium album*, *Fallopia convolvulus*, *Galeopsis tetrahit*, *Galium aparine*, *Mentha arvensis*, *Myosotis arvensis*, *Persicaria maculata*, *Polygonum aviculare* agg., *Potentilla anserina*, *Raphanus raphanistrum*, *Sonchus arvensis*, *Spergula arvensis*, *Stellaria media*, *Tripleurospermum inodorum*, *Viola arvensis*

**Synmorphology:** The community forms two-layer stands with the dominant species: *Cirsium arvense*, *Galeopsis tetrahit*, *Fallopia convolvulus*, *Raphanus raphanistrum*, *Tripleurospermum perforatum*.

**Synecology:** The community occurs in the stands of cereals (wheat, rye, oat) in the submontane belts in the sugar-beet type at altitudes of 550-750 m above s.l. The mean annual temperature is 4-7 °C, the mean annual precipitation is 650-800mm. The substrate is skeletal and acid.

**Syntaxonomy:** PASSARGE, JURKO (1975) have recorded the variant with *Mentha arvensis* and with the humid subvariant with *Filaginella uliginosa* within the community.

**Synchorology:** The association is recorded from Liptovská kotlina basin (PASSARGE, JURKO 1975; STANO 1980b), Volovské vrchy Mts., Skorušinské vrchy Mts., Oravská kotlina basin, Popradská kotlina basin, Levočské vrchy Mts. (PASSARGE, JURKO 1975).

**Note:** There are the endangered species in the community: *Chenopodium vulvaria* (V), *Cyanus segetum* (I), *Lolium temulentum* (E).

### 13. *Aphano arvensis*-*Matricarietum chamomillae* R. Tx. 1937

**Syn.:** *Alchemillo arvensis*-*Matricarietum Chamomillae* R. Tx. 1937 (article 45)

**Tables** 1 and 3, column 13

**Differential taxa:** *Fumaria vaillantii*, *Matricaria recutita*

**Constantly accompanying taxa:** *Capsella bursa-pastoris*, *Consolida orientalis*, *Cyanus segetum*, *Sinapis arvensis*, *Stellaria media*, *Thlaspi arvense*, *Tripleurospermum inodorum*, *Vicia hirsuta*, *Viola arvensis*

**Synmorphology:** The species of the community divides it vertically into two well differentiated layers. Most species are concentrated in the upper layer. The major part of biomass is concentrated here, too. The species of the alliance *Scleranthion annui* and those of the order *Atriplici-Chenopodietalia* are represented rather rich, because the community is developed on less suitable soil types in relatively cold and humid sites. Accessory species are represented in a rather high degree by species of the classes *Polygono-Poetea* and *Sedo-Scleranthetea*. In the flowering phase of the species *Matricaria recutita*, the stands become poorer at some localities because of the collecting the medicinal plants.

**Symphonology:** The optimum of the development is in the summer agroecophase, in June-July both for the community and for agricultural plants. In that time, the dominant and subdominant species are in full flowering phase.

**Synecology:** The community has been recorded in the stands of wheat and *Brassica napus*. It occurs on various soil types, mainly on gley alluvial soils. The soils are loamy to clay and they develop on alluvial sediments. The reaction is slightly acid to acid and the soils are without any skeleton.

**Synchorology:** The community is distributed mainly in the colline and planar belts in a moderately warm climatic region (KROPÁČ 1981). There are records only from Východoslovenská rovina lowland, mostly from the northern and middle part (MOCHNACKÝ 1984, 1987).

**Note:** It is a rare community endangered by melioration and agricultural engineering. There are the endangered species there: *Aphanes arvensis* (I), and *Lolium temulentum* (E).

#### 14. *Cannabio ruderalis-Silenetum noctiflorae* SCHUBERT & al. 1981

**Tables** 1 and 3, column 14

**Characteristic taxa:** *Cannabis ruderalis* (dom.)

**Differential taxa:** *Conyza canadensis*, *Lactuca serriola*, *Silene noctiflora*

**Constantly accompanying taxa:** *Capsella bursa-pastoris*, *Chenopodium album*, *Consolida regalis*, *Convolvulus arvensis*, *Elytrigia repens*, *Fallopia convolvulus*, *Raphanus raphanistrum*, *Stellaria media*, *Tripleurospermum perforatum*, *Vicia hirsuta*

**Synmorphology:** The physiognomy and the vertical structure of the stands do not differ much. Only a few species have the highest constancy, most frequently *Cannabis ruderalis*, *Capsella bursa-pastoris*, *Chenopodium album*, *Silene noctiflora*, and *Tripleurospermum perforatum*. Concerning the life forms, therophytes predominate over hemicryptophytes in the number of species. Geophytes participate much less in the community. There can be distinguished three layers in the stands. Beside the high, dominant species mentioned, which reach into the height of 120 cm, there are middle high species in the stands: *Consolida regalis*, *Raphanus raphanistrum* and *Sinapis arvensis*. The prevailing part of assimilation mass is concentrated in the stands developed in the height of about 50-100 cm. The cover value of rather small species up to 30 cm is low. They grow mostly in the stands in the field margins receiving more light. There is often the synusia of the creepers *Convolvulus arvensis*, *Fallopia convolvulus* arisen in the stands. The lowest layer is formed by mosses in some places. The community is middle high to high, with the mean cover value of 60-80 %.

**Symphenology:** *Cannabio ruderalis-Silenetum noctiflorae* achieves the optimum of its development in the summer agroecophase in June-July. In that time, the dominant species are in full flowering phase. At the beginning of August, the ripening and propagation of seeds come on.

**Synecology:** The sites of the community are dry, well warmed, situated on moderately wavy plains to moderate slopes facing south and southeast sand dunes. It prefers deep to middle deep soils. As to the texture, it prefers sandy, loamy-sandy, sandy-loamy soils, but it occurs on loamy to clay-loamy soils, too.

The reaction of these soils is slightly acid to neutral. The community occurs mostly in the stands of the cereals (rye, barley).

**Syntaxonomy:** The community *Cannabio ruderalis-Silenetum noctiflorae* from Východoslovenská rovina lowland approaches as for its floristic composition and site conditions to the syntaxa presented by SCHUBERT & al. (1981) and MIRKIN & al. (1985) from the territory of Bashkir republic. Comparing our phytocoenological material with that published by SCHUBERT & al. (l. c.), we have found a striking similarity of weed communities in spite of a large distance of the areas and phytogeographical differences. We have not recorded some species like *Axyris amaranthoides*, *Collomia linearis*, *Polygonum alpinum*, *Carduus thoermeri* and *Lactuca tatarica*. The last mentioned species occurs in Východoslovenská rovina lowland (KRIPPELOVÁ, ŠPÁNIKOVÁ 1963; JEHLÍK 1980), but only like an epiphyte.

**Synchorology:** The community *Cannabio ruderalis-Silenetum noctiflorae* is distributed less and it is rare. There are records from Východoslovenská rovina lowland from the southern and south-eastern part (MOCHNACKÝ 1987, 1989).

#### 15. *Erophilo-Arabidopsietum* KROPÁČ in KRIPPELOVÁ 1981

**Syn.:** *Erophilo-Arabidopsietum* KROPÁČ 1981 (article 1)

**Pseudonymum:** *Papaveretum argemones* sensu PASSARGE & JURKO 1975

**Tables** 1 and 3, column 15

**Differential taxa:** *Erophila verna* (subdom.), *Buglossoides arvensis*

**Constantly accompanying taxa:** *Arabidopsis thaliana*, *Capsella bursa-pastoris*, *Tripleurospermum perforatum*, *Viola arvensis*

**Synmorphology:** The community is poor in species with a little cover value. The ephemeral species *Arabidopsis thaliana*, *Erophila verna* and *Lamium amplexicaule* predominate. The species spectrum is richer in the stands of the cereals wheat and rye than in vineyards and the community persists longer too. As a result of the hoeing of vine, dunging and chemical treatment, the species spectrum becomes poorer, by species like *Erophila verna*, *Lamium purpureum*, *Thlaspi arvense* disappear. On the contrary, the species composition is enriched by some species of the classes *Polygono-Poetea*, *Artemisietea vulgaris* and *Molinio-Arrhenatheretea*, like *Acetosa pratensis*, *Arctium tomentosum*, *Crepis biennis*, *Dactylis glomerata*, *Poa pratensis*, *Taraxacum* sect. *Ruderalia*, and *Trifolium repens*, penetrating into the stands from contact communities.

**Synecology:** *Erophilo-Arabidopsietum* occurs in planar to submontane belts, in a moderately warm to cold climatic region (KROPÁČ 1981, KRIPPELOVÁ 1981). The community occurs in cereals, on illimerized oligobasic luvisol, on sandy-loamy soils in some places and rarely on sands. The community can be found also in vineyards on sands and volcanic tuffs. The soil reaction is acid to neutral. The soils are skeletal or without any skeleton. The community occurs in the sites of original oak-hornbeam forests.

**Syndynamics:** The life cycle of the community begins in early spring months when the stands of agricultural plants are developed slightly, with a small

canopy. Low cover values of several species having their phenological optimum in summer, participate in the favourable development of the community. Moisture conditions, very favourable in the springtime, are important, too. Later, as a result of warming of the site and of water diminution by evapotranspiration accelerated by drying wind streams, the dominant species lose their vitality. The species with their phenological optimum in summer do gradually well in the mosaic stands. The optimum of the community's development lies in the spring agroecophase, in April-May. The species of the alliance *Scleranthion annui* and those of the order *Atriplici-Chenopodietalia albi* are presented in the sites of *Erophilo-Arabidopsietum* in the summer agroecophase in a higher degree and other communities are formed. The development tends to the community *Consolido-Anthemidetum austriaceae* in the rather warm sites in the cereals. *Erophilo-Arabidopsietum* is transformed to the community *Portulacetum oleraceae* in the southern warm sites in the summer agroecophase. At localities situated to the north, the development tends to the communities of the alliance *Veronico-Euphorbion*.

**Synchorology:** There are records from Košická kotlina basin (KRIPPELOVÁ 1981), Východoslovenská rovina lowland (MOCHNACKÝ 1984, 1985a).

**Note:** It is a rare community, we have recorded the occurrence of three endangered species here: *Aphanes arvensis* (I), *Cyanus segetum* (I), and *Myosurus minimus* (V).

#### **Spergulo-Oxalidion GÖRS in OBERD. & al. 1967**

**Syn.:** *Veronico-Euphorbion pepili* SISSINGH 1942 (article 1), *Polygono-Chenopodion Polyspermi* BR.-BL. & R. TX. 1943 (article 8, 31), *Oxalidion europeae* (GÖRS 1967) PASSARGE 1978 (article 29)

**Non:** *Polygono-Chenopodion polyspermi* KOCH 1926 (article 8), *Spergulo-Erodion* J. TX. in PASSARGE 1964

**Tables** 1 and 3, column 16

**Characteristic taxa:** *Chenopodium polyspermum*, *Euphorbia peplus*, *Oxalis fontana*

**Differential taxa:** *Bidens tripartita*, *Calystegia sepium*, *Persicaria hydropiper*, *Symphytum officinale*

The alliance includes the weed communities, which are characteristic for the stands of root crops and vegetables in middle Europe. They occur from lowlands to montane belts. In places situated higher, they occur in cereals and technical agricultural plants. The optimum of their development is in the sugar-beet and potato type. There is only the segetal community *Panico-Chenopodietum polyspermi* from the alliance in Slovakia.



16. *Panico-Chenopodietum polyspermi* R. TX. 1937

**Syn.:** *Chenopodietum polyspermi* BR.-BL. 1921 (article 2b), "Asociation à *Chenopodium polyspermum* et *Persicaria maculata* " MALCUIT 1929 (article 2b), *Oxalido-Chenopodietum polyspermi medioeuropaeum* R. TX. 1950 (article 34)

**Syntax. syn.:** *Oxalido-Chenopodietum* SISSINGH 1950, *Rorippo-Chenopodietum polyspermi* KOHLER 1962

**Tables** 1 and 3, column 16

**Characteristic taxa:** *Chenopodium polyspermum*

**Constantly accompanying taxa:** *Chenopodium album*, *Cirsium arvense*, *Echinochloa crus-galli*, *Oxalis fontana*, *Scleranthus annuus*, *Setaria pumila*, *Tripleurospermum perforatum*, *Veronica persica*

**Synmorphology:** The physiognomy of the community depends on the agricultural plants, which limit some structural components of the community. It occurs mainly in the stands of maize, beet and wheat. It forms three-layer stands in the maize fields. In the beet and wheat fields, the stands have two layers. In the stands of maize, in the upper layer, there are species which dependent on trophic conditions in the stands reach the height of 120-180cm. They are mainly: *Amaranthus retroflexus*, *Cirsium arvense*, *Echinochloa crus-galli*, *Sinapis arvensis*, *Raphanis raphanistrum* and *Tripleurospermum perforatum*. There are 80 % of the species of the community presented in the middle layer, which is of the largest assimilation area and of the biggest biomass. The species *Capsella bursa-pastoris*, *Chenopodium album*, *C. polyspermum*, *Oxalis fontana*, *Persicaria \* lapathifolia*, *Setaria pumila* and *S. viridis* dominate here. There are species using free ecological niches in the lower layer. They are mainly moisture-loving species tolerant to shade, which compensate the lack of other factors with good store of mineral nutrients and organic substances in the soil like *Anagallis arvensis*, *Filaginella uliginosa*, *Gypsophila muralis*, *Juncus bufonius*, *Lythrum hyssopifolium*, *Plantago major*, *Poa annua*, *Stellaria media* and others. Mosses occur in some places too, mostly in the stands of wheat. The synusia of the mosses approaches according to the species composition to the association *Centunculo-Anthocerotetum* W.KOCH 1926 (the moss community on humid, calcium-free, clay soils inundated with water in the springtime). Therophytes predominate over hemicryptophytes and geophytes. As to the life cycle, late-spring annuals predominate over winter annuals and early-spring annuals. Perennials have a rather high representation.

**Symphenology:** The stands of the community arise in the summer agroecophase in June-July. They achieve their optimum in the autumn agroecophase in September-October. In the half September the fruiting phase of the dominant species comes on. In the stands of maize and beet, the vegetation periode is prolonged to the end of September, sometimes to the half October when the crop is collected.

**Synecology:** *Panico-Chenopodium* occurs from lowlands to the montane belts in rather cold and humid regions in the potato type (Kropáč 1981). On the plains of

lowlands, it can be found on alluvial sediments. It prefers rather heavy soil types like brown illimerized soils, brown ungley soils, alluvial soils and alluvial gley soils. It grows less on illimerized and illimerized gley soils.

As to the soil texture, the soils are loamy or clay. They are often inundated with water or waterlogged in the springtime and in the autumn. In the summertime the soils become deep dry, they burst polygonally and a few cm wide gaps arise. In this periode, the conditions for the development of the agricultural plants are the most unfavourable.

**Syntaxonomy:** Syntaxonomical revision of phytocoenological material has confirmed the existence of two subassociations:

(1) *Panico-Chenopodietum polyspermi typicum* BRUN-HOOL 1963

The community occurs in the stands of maize, wheat, barley, oat, but it was recorded also from beetroot fields on soils rich in minerals, on fresh humid loamy neutral to slightly basic soils. It is distinguished negatively from the next subassociation.

(2) *Panico-Chenopodietum polyspermi scleranthetosum* Brun-Hool 1963

The community develops in the stands of sugar-beet, potatoes and maize on slightly acid to acid soils (KRIPPELOVÁ 1981). The variant with *Gypsophila muralis* described by KRIPPELOVÁ (1981) from Košická kotlina basin and the variant with *Plantago major* have been confirmed within the subassociation.

**Synchorology:** The community *Panico-Chenopodietum polyspermi* is known from Košická kotlina basin (KRIPPELOVÁ 1981), Východoslovenská rovina lowland (MOCHNACKÝ 1982, 1985b), Žiarska kotlina basin, Horehronské podolie and Liptovská kotlina basin (PASSARGE, JURKO 1975).

**Note:** There are several endangered and more rare species in the community: *Bromus secalinus* (Vm, R), *Cyanus segetum* (I), *Galium tricornutum* (Vm), *Kickxia spuria* (I), *Lythrum hyssopifolia* (I), *Mysopates orontium* (I), *Centaurium erythraea*, *Consolida orientalis* and *Xanthium strumarium*.

#### ***Panico-Setarion* SISSINGH in WESTHOFF & al. 1946**

**Syn.:** *Spergulo-Erodion* J. TX. 1966 (article 8), *Mercurialion annuae* RIES 1991 (article 1, 5)

**Syntax. syn.:** *Spergulo-Erodion* J. TX. in PASSARGE 1964

**Incl.:** *Panico-Setarenion* (SISSINGH in WESTHOFF & al. 1946) OBERD. 1957, *Digitario-Setarenion* (SISSINGH in WESTHOFF & al. 1946) T. MÜLLER 1983 (article 30)

The communities of the alliance occur in the stands of root crops, vegetables and special agricultural plants. They can be found on sandy and loamy illimerized soils. They occur in the planar and colline belts dispersed in all Slovakia.

17. *Echinochloo-Setarietum pumilae* FELFÖDY 1942 corr. MUCINA 1993

**Syn.:** *Setario glaucae-Galinsogetum* R. TX. 1950 (article 29, 43), *Chenopodio-Setarietum* ZÁHRADNÍKOVÁ-ROŠETZKÁ 1955 (article 43), *Amarantho retroflexi-Diplotaxietum muralis* HOLZNER 1970 (article 2b), *Diplotaxidi muralis-Amaranthesetum retroflexi* HOLZNER 1973 nom. inv. (article 29)

**Pseudonymum:** „*Panicetum ischaemi*“ sensu MOCHNACKÝ

**Non:** *Echinochloo-Setarietum viridis* SISSINGH & al. 1940, *Panicetum ischaemii* R. TX. 1950

**Tables** 1 and 3, colimn 17

**Constantly accompanying taxa:** *Echinochloa crus-galli* (dom.), *Galinsoga parviflora* (dom.), *Amaranthus retroflexus*, *Chenopodium album*, *Cirsium arvense*, *Fallopia convolvulus*, *Setaria pumila*

**Synmorphology:** The community is distributed in large areas. As to the vertical structure, there are three well differentiated layers in the stands. The upper one up to 150 cm (up to 180 cm in some stands of maize and sunflowers) consists of the therophytes, which are the dominant species of the community: *Amaranthus retroflexus*, *Cirsium arvense*, *Chenopodium album*, *Echinochloa crus-galli* and *Tripleurospermum perforatum*. They form the substantial part of biomass and they are an expressive element participating on the whole physiognomy of the community. The middle layer is formed by the species having their reproduction organs usually in the height up to 100 cm. The lower one consists of the species not demanding much light and warm. They make groups in rather humid places. They are frequently the species like *Filaginella uliginosa*, *Gypsophila muralis*, *Lythrum hyssopifolia*, *Plantago major*, *Rumex crispus* and *Trifolium repens*. As to the life cycle, late-spring annuals predominate over winter annuals and early-spring annuals.

**Symphenology:** The community achieves the optimum of its development in the autumn agroecophase in September-October. In that time the dominant and subdominant species have got their phenological optimum. Since half September the ripening and propagation of seeds begin.

**Synecology:** The community arise mainly in the stands of special agricultural and technical plants. It can be found less often in the vegetable stands of carrot, cucumber and radish. It is limited to light to middle heavy, loamy-sandy to clay-loamy, often illimerized soils developed on alluvial sediments. The soil reaction is acid and the soils are without any skeleton. From the viewpoint of syngenetics, flood plain willow-poplar and lowland flood plain forests represented original vegetation (MICHALKO & al. 1986).

**Syntaxonomy:** After the synthesis of 153 phytocoenological relevés, a physiognomically different type with the dominant species *Galinsoga parviflora* is valued only as a variant. In spite of the preferring of rather light soils, it is not expressed in the species composition of the stands.

**Synchorology:** *Echinochloo-Setarietum pumilae* belongs to the communities represented much in the agrocoenoses of Slovakia. It is distributed currently in

planar and colline belts, in a warm to moderately warm climatic region (KROPÁČ 1981). There are records from Trnavská pahorkatina hills (PASSARGE, JURKO 1975; ELIÁŠ 1979d), Podunajská rovina lowland (PASSARGE, JURKO 1975; MUCINA ined.; MUCINA, MAGLOCKÝ ined.), Žitavská pahorkatina hills (ELIÁŠ 1978a, PASSARGE, JURKO 1975; MUCINA ined.), Borská rovina lowland, Nitrianska pahorkatina hills, Liptovská kotlina basin (PASSARGE, JURKO 1975), Košická kotlina basin (KRIPPELOVÁ 1981; STANO 1980a), and Východoslovenská rovina lowland (MOCHNACKÝ 1982, 1984, 1985b).

**Note:** There are several endangered species in the community: *Aphanes arvensis* (I), *Chenopodium vulvaria* (V), *Cyanus segetum* (I), *Kickxia elatine* (I), *K. spuria* (I), *Lolium temulentum* (E), *Lotus uliginosus* (Vm), *Lythrum hyssopifolia* (I), *Mysopates orontium* (I) and *Anagallis foemina*, *Fumaria rostellata*, *Polycnemum arvense* as more rare.

18. *Stachyo annui-Setarietum pumilae* FELFÖLDY 1942 corr. MUCINA 1993

**Syn.:** *Stachyo annui-Setarietum glaucae* FELFÖLDY 1942 (article 43)

**Syntax. syn.:** *Ajugo chamaepitys-Setarietum glaucae* KRIPPELOVÁ 1981 (article 43)

**Non:** *Echinochloo-Setarietum pumilae* FOLFÖLDY 1942 corr. MUCINA 1993

**Tables** 1 and 3, column 18

**Differential taxa:** *Ajuga chamaepitys*, *Stachys annua*

**Constantly accompanying taxa:** *Chenopodium album*, *Cirsium arvense*, *Convolvulus arvensis*, *Echinochloa crus-galli*, *Falopia convolvulus*, *Setaria pumila*, *S. viridis*

**Synmorphology:** The community occurs in the stands of root crops and special agricultural plants. It forms rich stands, which can be vertically divided in two layers. The dominant species *Amaranthus retroflexus*, *Chenopodium album* and *Convolvulus arvensis* predominate in the upper layer. The lower one consists of the species *Ajuga chamaepitys*, *Setaria pumila* and *Falopia convolvulus*.

**Synecology:** The sites of the association are distributed in a warm region poor in precipitation, in the maize type. They occur on carbonate basic to neutral soils (pH 7.7-8.6). There is little humus in the soils.

**Syndynamics:** For the present, the community is recorded only from Slovenský kras karst (KRIPPELOVÁ 1981), Košická and Popradská kotlina basins (MUCINA ined.).

**Note:** Endangered and more rare species are represented occasionally in the community by species *Cyanus segetum* (I), *Kickxia elatine* (I), *Lythrum hyssopifolia* (I), *Anagallis foemina*, *Malva pusilla* and *Xanthium strumarium*.

### **Eragrostietalia J. Tx. ex POLI 1966**

Thermophilous communities of C<sub>4</sub> therophytes on loose substrata

**Syn.:** *Eragrostietalia* J. Tx. in LOHMEYER & al. 1962 (article 8), *Eragrostietalia* J. Tx. in MATUSZKIEWICZ 1962 (article 8)

**Tables** 1 and 4, columns 19-20

**Characteristic taxa:** *Cynodon dactylon*, *Digitaria sanguinalis*, *Eragrostis minor*, *Portulaca oleracea*, *Salsola australis*, *Setaria viridis* (transgr.)

**Differential taxa:** *Carex hirta*, *Psidium arenarium*, *Saponaria officinalis*, *Senecio viscosus*

The thermophilous ruderal and segetal communities of therophytes on loose sandy and drying up soils. The species with C<sub>4</sub> assimilation and S-R strategy are the edificators of the communities. Several of them are densely clustered, fine-leaved grasses of prostrate habitus, with a rich system of fine roots like *Setaria*, *Digitaria*, *Eragrostis*, *Panicum* or xeromorphic therophytes like *Portulaca oleracea* and *Salsola australis* (KRIPPELOVÁ, MUCINA 1988). The center of the distribution of the communities belonging to the order *Eragrostietalia* lies in southern and south-eastern Europe, the order disappears gradually in regions more north in middle and west Europe (POLI 1966).

In Slovakia, the communities of the order occur in the warmest and driest region on sandy to gravelly soils on river alluvium, in surroundings of gravelworks, sandworks and on ruderal feet of sand dunes in Borská rovina lowland, Podunajská rovina lowland in surroundings of town of Komárno, Galanta, Nové Zámky and Štúrovo and in the south of Východoslovenská rovina lowland (KRIPPELOVÁ, MUCINA l. c.).

The order is represented by three alliances in Slovakia: *Eragrostion*, *Salsolion ruthenicae* and *Eragrostio-Polygonion arenastri*.

### **Eragrostion R. Tx. ex OBERD. 1954**

**Syn.:** *Amaranthion* R. Tx. & PREISINGH 1942 (article 1), *Polygonion tomentosum* SISSINGH 1942 (article 1), *Consolido-Eragrostion poaeoidis* SOÓ & TIMÁR in TIMÁR & BODROGKÖZY 1959 (article 8)

**Syntax. syn.:** *Amarantho-chenopodium albi* MORARIU 1943 (article 2b, 8)

**Incl.:** „*Eragrostidion*-Unterverband“ R. Tx. 1950

**Table** 1 and 4, columns 19-20

**Nomenclatural note:** MORARIU (1943) has only considered (pages 182-183 and 202) the probable existence of a new alliance *Amarantho-Chenopodium albi*, which would be vicarious with the alliance *Diploaxion* BR.-BL. (1931) 1936, but all described communities have been left in the alliance *Diploaxion*. Therefore the name *Eragrostion* established by TÜXEN (1937) and validated by OBERDORFER (1954) is valid (KROPÁČ in litt.).

**Table 4. Synoptic table of the alliance *Eragrostion***

| Column                                 |    | 19               | 20               |
|--|----|------------------|------------------|
| Number of relevés                      |    | 19               | 16               |
| Average number of species              |    | 16               | 18               |
| <i>Hibiscus trionum</i>                | C1 | V <sup>2</sup>   | II <sup>2</sup>  |
| <i>Eragrostis cilianensis</i>          | C1 | IV <sup>3</sup>  | .                |
| <i>Lathyrus tuberosus</i>              | D1 | IV <sup>2</sup>  | I <sup>1</sup>   |
| <i>Amaranthus lividus</i>              | D1 | IV <sup>2</sup>  | II <sup>2</sup>  |
| <i>Hyoscyamus niger</i>                | D1 | III <sup>2</sup> | .                |
| <i>Lamium amplexicaule</i>             | D1 | III <sup>2</sup> | .                |
| <i>Veronica hederifolia</i>            | D1 | III <sup>2</sup> | .                |
| <i>Galium aparine</i>                  | D1 | III <sup>1</sup> | I <sup>3</sup>   |
| <i>Lamium purpureum</i>                | D2 | .                | II <sup>2</sup>  |
| <i>Aristolochia clematitis</i>         | D2 | .                | II <sup>2</sup>  |
| <i>Lactuca serriola</i>                | .  | .                | I <sup>1</sup>   |
| <i>Eragrostis minor</i>                | .  | V <sup>2</sup>   | III <sup>4</sup> |
| <i>Portulaca oleracea</i>              | .  | II <sup>2</sup>  | V <sup>3</sup>   |
| <i>Calamagrostis epigejos</i>          | .  | .                | I <sup>2</sup>   |
| <i>Elytrigia repens</i>                | .  | .                | I <sup>2</sup>   |
| <i>Trifolium arvense</i>               | .  | .                | I <sup>2</sup>   |
| <i>Carex hirta</i>                     | .  | .                | I <sup>2</sup>   |
| <b>Amarantho-Chenopodion</b>           |    |                  |                  |
| <i>Gypsophila muralis</i>              | D  | II <sup>2</sup>  | I <sup>2</sup>   |
| <i>Heliotropium europaeum</i>          | C  | .                | I <sup>2</sup>   |
| <b>Eragrostio-Polygonion arenastri</b> |    |                  |                  |
| <i>Malva plusilla</i>                  | D  | .                | I <sup>2</sup>   |
| <i>Matricaria disciodes</i>            | D  | .                | I <sup>2</sup>   |
| <b>Ergrostietalia</b>                  |    |                  |                  |
| <i>Cynodon dactylon</i>                | .  | III <sup>1</sup> | II <sup>3</sup>  |
| <i>Setaria viridis</i>                 | .  | .                | III <sup>2</sup> |
| <b>Stellarietea mediae</b>             |    |                  |                  |
| <i>Conyza canadensis</i>               | .  | I <sup>2</sup>   | III <sup>2</sup> |
| <i>Amaranthus retroflexus</i>          | .  | V <sup>2</sup>   | IV <sup>3</sup>  |
| <i>Chenopodium album</i>               | .  | V <sup>2</sup>   | III <sup>3</sup> |
| <i>Echinochloa crus-galli</i>          | .  | III <sup>1</sup> | IV <sup>3</sup>  |
| <i>Digitaria sanguinalis</i>           | .  | IV <sup>2</sup>  | V <sup>5</sup>   |
| <i>Fallopia convolvulus</i>            | .  | .                | II <sup>2</sup>  |
| <i>Setaria pumila</i>                  | .  | V <sup>2</sup>   | III <sup>3</sup> |
| <i>Solanum nigrum</i>                  | .  | II <sup>2</sup>  | I <sup>1</sup>   |
| <i>Galinsoga parviflora</i>            | .  | IV <sup>2</sup>  | III <sup>3</sup> |
| <i>Capsella bursa-pastoris</i>         | .  | .                | III <sup>2</sup> |
| <i>Atriplex patula</i>                 | .  | .                | I <sup>1</sup>   |
| <i>Datura stramonium</i>               | .  | II <sup>1</sup>  | I <sup>2</sup>   |
| <i>Malva sylvestris</i>                | .  | II <sup>1</sup>  | I <sup>2</sup>   |
| <i>Stachys annua</i>                   | .  | I <sup>1</sup>   | .                |
| <i>Oxalis fontana</i>                  | .  | II <sup>1</sup>  | I <sup>2</sup>   |
| <i>Stellaria media</i>                 | .  | .                | IV <sup>3</sup>  |

Tab. 4. continued (1)

|                                 |                  |                  |
|---------------------------------|------------------|------------------|
| <i>Anthemis austriaca</i>       | .                | I <sup>2</sup>   |
| <i>Sonchus arvensis</i>         | .                | I <sup>1</sup>   |
| <i>Chenopodium hybridum</i>     | .                | I <sup>2</sup>   |
| <i>Sinapis arvensis</i>         | .                | I <sup>2</sup>   |
| <i>Anagallis arvensis</i>       | .                | I <sup>2</sup>   |
| <i>Mentha arvensis</i>          | .                | I <sup>1</sup>   |
| <i>Fumaria vaillantii</i>       | .                | I <sup>2</sup>   |
| <i>Thlaspi arvense</i>          | .                | I <sup>5</sup>   |
| <i>Vicia villosa</i>            | .                | I <sup>1</sup>   |
| <b>Others</b>                   |                  |                  |
| <i>Artemisia vulgaris</i>       | I <sup>2</sup>   | II <sup>1</sup>  |
| <i>Convolvulus arvensis</i>     | III <sup>2</sup> | IV <sup>3</sup>  |
| <i>Achillea millefolium</i>     | .                | I <sup>1</sup>   |
| <i>Erodium cicutarium</i>       | .                | I <sup>2</sup>   |
| <i>Plantago major</i>           | IV <sup>2</sup>  | I <sup>4</sup>   |
| <i>Trifolium repens</i>         | II <sup>1</sup>  | II <sup>1</sup>  |
| <i>Poa annua</i>                | .                | I <sup>2</sup>   |
| <i>Echium vulgare</i>           | .                | I <sup>1</sup>   |
| <i>Equisetum arvense</i>        | III <sup>2</sup> | I <sup>4</sup>   |
| <i>Tanacetum vulgare</i>        | I <sup>2</sup>   | I <sup>1</sup>   |
| <i>Rumex crispus</i>            | .                | I <sup>2</sup>   |
| <i>Cirsium arvense</i>          | .                | II <sup>2</sup>  |
| <i>Chenopodium glaucum</i>      | II <sup>1</sup>  | .                |
| <i>Cichorium intybus</i>        | .                | I <sup>1</sup>   |
| <i>Glechoma hederacea</i>       | .                | I <sup>1</sup>   |
| <i>Amaranthus chlorostachys</i> | II <sup>2</sup>  | III <sup>2</sup> |
| <i>Bidens tripartita</i>        | I <sup>1</sup>   | .                |
| <i>Buglossoides arvensis</i>    | I <sup>3</sup>   | .                |
| <i>Chamomilla suaveolens</i>    | .                | I <sup>1</sup>   |
| <i>Crepis biennis</i>           | .                | I <sup>1</sup>   |
| <i>Cucurbita pepo</i>           | I <sup>2</sup>   | .                |
| <i>Lotus corniculatus</i>       | .                | I <sup>1</sup>   |
| <i>Lythrum hyssopifolia</i>     | I <sup>1</sup>   | I <sup>2</sup>   |
| <i>Matricaria perforata</i>     | III <sup>2</sup> | IV <sup>2</sup>  |
| <i>Medicago sativa</i>          | .                | I <sup>1</sup>   |
| <i>Melandrium album</i>         | I <sup>1</sup>   | II <sup>2</sup>  |
| <i>Polygonum aviculare</i>      | I <sup>2</sup>   | II <sup>2</sup>  |
| <i>Polygonum lapathifolium</i>  | I <sup>2</sup>   | II <sup>2</sup>  |
| <i>Ranunculus repens</i>        | .                | I <sup>1</sup>   |
| <i>Rorippa sylvestris</i>       | I <sup>2</sup>   | I <sup>2</sup>   |
| <i>Rubus caesius</i>            | I <sup>1</sup>   | I <sup>1</sup>   |
| <i>Taraxacum officinale</i>     | II <sup>2</sup>  | IV <sup>2</sup>  |
| <i>Trifolium pratense</i>       | .                | I <sup>2</sup>   |
| <i>Urtica dioica</i>            | I <sup>1</sup>   | I <sup>1</sup>   |
| <i>Zea mays</i>                 | I <sup>7</sup>   | .                |

The alliance includes the thermophilous communities with the centre of their distribution in Pannonian region and in Balkan. The northern border of its distribution passes over Slovakia, southern Moravia and Austria. The communities of the alliance occur in root crops, in vineyards and special agricultural plants. They occur on light sandy, neutral to basic soils. The soils are poor in nutrients. In Slovakia, they occur in the maize type.

Note: HEJNÝ and KROPÁČ (in MORAVEC & al. 1995:139) mentioned the association *Amarantho-Chenopodietum* SOÓ 1947 within the alliance from "Pannonian region" (the southern part of Slovakia is probably considered too). We were not able to identify this vegetation type in our phytocoenological material.

#### 19. *Hibisco-Eragrostietum* SOÓ & TIMÁR 1957

**Syn.:** "*Hibisceto-Eragrostietum pooidis*" SOÓ & TIMÁR 1951 (article 1), *Portulaca oleracea-Digitaria sanguinalis* TIMÁR 1953 (article 1) et *portulacosum* BODROGKÖZY 1954, *Eragrostis major-Eragrostis minor* SLAVNIČ 1944 (article 1), *Hibisco trionum-Eragrostis megastachya* R. TX. 1950, *Setaria-Heliotropium europaeum* SLAVNIČ 1944 a *Panicum sanguinale-Eragrostis minor* R. TX. 1942 (article 1)

**Incl.:** *Amatantho-Chenopodietum eragrostietosum* BODROGKÖZY 1954

**Tables** 1 and 4, column 19

**Characteristic taxa:** *Eragrostis cilianensis*, *Hibiscus trionum*

**Differential taxa:** *Hyoscyamus niger*, *Lamium amplexicaule*, *Plantago major*, *Veronica hederifolia*

**Constantly accompanying taxa:** *Amaranthus retroflexus*, *Chenopodium album*, *Convolvulus arvensis*, *Digitaria sanguinalis*, *Galinsoga parviflora*, *Setaria pumila*, *Tripleurospermum perforatum*

**Synmorphology:** The community forms physiognomically striking stands in vegetables and special agricultural plants. The C<sub>4</sub> species of the family Poaceae like *Cynodon dactylon*, *Digitaria sanguinalis*, *Echinochloa crus-galli*, *Eragrostis cilianensis* and *Setaria pumila* are rich represented in the community. These species characterize its appearance. There are usually two layers formed in the stands. The higher plants *Amaranthus powellii*, *A. retroflexus*, *Chenopodium album* and *Tripleurospermum perforatum* grow usually in groups up to the height of about 80 cm and they form the upper layer. The substantial part of biomass is concentrated in the lower layer. There are the thermophilous and heliophilous species of the order *Eragrostietalia* with a high frequency, abundance and dominance in the stands. As a result of intensive treatments, the species diversity of the community is low. The mean number of species is 19. The mean cover value of the stands is 40 %. As to the life forms, late-spring annuals are of the highest representation. There are few early-spring annuals and ephemeral ones. In southern Slovakia, there is the north border of community's distribution in middle Europe. Because of a colder climate and acider soil substrata, some



thermophilous and calciphilous species of Pannonian flora are missing in the floristic composition. We have not recorded in phytocoenological material from Východoslovenská rovina lowland even *Amaranthus albus*, *Chondrilla juncea*, *Melampyrum barbatum*, *Orobancha cumana*, *Salsola australis*, *Setaria verticillata* and *Sorghum halepense* although some of them occur in other communities.

**Symphenology:** The stands of the community achieve the optimum of their development in the autumn agroecophase in September - October.

**Synecology:** *Hibisco-Eragrostietum* is a good indicator for the warmest sites. The community colonizes rather light soil types. Its occurrence is concentrated on carbonate alluvial soils and degraded chernozems. It can be found rarely on luvisol and alluvial soils. These soil types are acid to neutral. They are developed on loess cover and less on alluvial sediments. The community occurs mainly in the vegetable stands of paprika, cucumber and tobacco. Intensive agrotechnical treatments during the vegetation period of agricultural plants do not enable the total floristic saturation of the community.

**Synchorology:** In Slovak territory, *Hibisco-Eragrostietum* is distributed only in the warmest region of the planar belt in the maize-barley type (KROPÁČ 1981, 1983). It has been found and recorded from plains and wavy plains in the southern and mainly south-eastern part of Východoslovenská rovina lowland at altitudes of 98-112 m a. s. l. (MOCHNACKÝ 1987, 1984, 1985a). ELIÁŠ (1982) published information on occurrence of community in Podunajská rovina lowland and Hronská pahorkatina hills.

**Note:** It is a rare and endangered community.

## 20. *Portulacetum oleraceae* FELFÖLDY 1942

**Syn.:** *Digitario-Portulacetum* (FELFÖLDY 1942) TIMÁR & BODROGKÖZY 1959 (article 29), *Panico sanguinalis-Eragrostietum* R. TX. 1950 (article 2b, 29)

**Tables** 1 and 4, column 20

**Differential taxa:** *Capsella bursa-pastoris*, *Poa annua*, *Stellaria media*

**Constantly accompanying taxa:** *Digitaria sanguinalis* (dom.), *Portulaca oleracea* (dom.), *Amaranthus retroflexus*, *Convolvulus arvensis*, *Echinochloa crus-galli*, *Setaria pumila*

**Synmorphology:** The community forms two-layer stands, which are distributed mosaicly in the stands of agricultural plants. The upper layer consists of species which according to the edaphic factors and the intensity of disturbance reach the height from 100 to 150 cm. They are e.g. *Amaranthus lividus*, *A. powellii*, *A. retroflexus*, *Chenopodium album*, *Cirsium arvense*, *Echinochloa crus-galli*, *Elytrigia repens*, *Tripleurospermum perforatum* and other. The populations of the species form the groups, which characterize the physiognomy of the community. The substantial part of the community's biomass is concentrated in the lower layer up to 100 cm. There is the optimum of most dominant and subdominant species there, e. g.: *Convolvulus arvensis*, *Conyza*

*canadensis*, *Digitaria sanguinalis*, *Echinochloa crus-galli*, *Eragrostis minor*, *Portulaca oleracea* and other. The mean cover value of the stands is 60 %.

**Symphenology:** The community is formed in the spring-summer agroecophase with the optimum of its development in the autumn agroecophase. In that time the dominant species and most subdominant ones are in full flowering phase. Since half August the fruits ripen gradually and the propagation of the seeds of some species comes on. In the time of the phenological optimum, the phytocoenoses of the community are homogeneous, floristically and ecologically well differentiated from other weed communities of the alliance *Eragrostion*. *Portulaca oleracea* becomes the dominant species in most stands and determines their physiognomy together with *Digitaria sanguinalis*.

**Synecology:** *Portulacetum oleraceae* occurs in the planar belts, in a warm to moderately warm climatic region (KROPÁČ 1981). It belongs to the most thermophilous communities in Slovakia. It occurs on light sandy, loamy-sandy and sandy-loamy soils. The soils are poor in minerals and water. Unfavourable trophic conditions are compensated by additional energy as dunging and watering according to the character and claims of the grown agricultural plants. The centre of the distribution lies in sand dunes in Medzibodrožie. It occurs in inclines up to 25° facing south and southeast at altitudes of 98-110 m a. s. l. In the past, there were oak-hornbeam forests in the sites of the community (MICHALKO & al. 1986).

**Synchorology:** The community is recorded from the southern and south-eastern part of Východoslovenská rovina lowland (MOCHNACKÝ 1987). ELIÁŠ (1981c, 1982) informed of the occurrence of the community in western Slovakia.

**Note:** The community belongs to rare and endangered communities because of the recultivation of suitable sites. The occurrence of the endangered species *Heliotropium europaeum* (l), *Lythrum hyssopifolia* (l) and *Malva pusilla* is rare.

## References

- BARKMAN J. J., DOING H. & SEGAL S. (1964): Kritische Bemerkungen und Vorschläge zur quantitativen Vegetationsanalyse. – Acta Bot. Nederl. 13: 394-419.
- BARKMAN J. J., MORAVEC J. & RAUSCHERT S. (1986): Code of phytosociological nomenclature. Code der Pflanzensoziologischen Nomenklatur. Code de nomenclature phytosociologique. - 2nd edition, Vegetatio 67: 145-195.
- BRAUN-BLANQUET J. 1964: Pflanzensoziologie. Grundzüge der Vegetationskunde. - 3. Aufl. – Springer Verlag, Wien-New York, 865 pp.
- DAHL E. & HADAČ E. (1941): Strandgesellschaften der Insel Ostoy im Oslofjord. – Nytt Mag. Naturv. 82: 251-312
- DEYL M. (1956): Plevelé polí a zahrad. – ČSAV, Praha, 374 pp.
- ČARNÍ A. & MUCINA L. (1997): Vegetation of trampled habitats dominated by C<sub>4</sub> plants in Europe. – J. Veg. Sci. (in press).
- ELIÁŠ P. (1974): Niektoré synantropné spoločenstvá horného Požitavia. – Acta Inst. Bot. Acad. Sci. Slov., Ser. A I: 197-211.
- ELIÁŠ P. (1980): Poznámky k sukcesii v neobrábaných vinohradoch. – Zpr. Čs. Bot. Společn. 15: 55-60.

- ELIÁŠ P. (1981): Spoločenstvá burín vo viniciach Československa. (2). – Vinohrad 8: 178-179.
- ELIÁŠ P. (1982): Tribulo-Tragetum a Hibisco-Eragrostietum na Slovensku. – Biológia 37: 99-101.
- ELIÁŠ P. (1984): Príspevok k flóre novobanských štálov v pohorí Tríbeč. – Rosalia 1: 107-130.
- ELIÁŠ P. (1986). Pre záchranu ohrozených synantropných rastlín na Slovensku. – Pamiatky Príroda 6: 196-198.
- FALIŃSKI J. B. (1966): Antropogeniczna roślinność Puszczy Białowieskiej jako wynik synantropizacji naturalnego kompleksu lesnego. – Rozpr. UW, 13, 256 pp.
- FALIŃSKI J. B. (1967): Przegląd zbiorowisk roślinnych Puszczy Białowieskiej i jej najbliższych okolic. – Mater. Zakl. Fitosoc. UW 20, Warszawa-Białowieża.
- FELFÖLDY L. (1942): Szociológiai vizsgálatok a pannónia flóratérület gyamvegetációján. – Acta Geobot. Hung. 5: 87-138.
- FIJALKOWSKI D. (1973): Beiträge zur Taxonomie der Segetalgesellschaften. – In: SCHUBERT R. & al.: Probleme der Agrobotanik. – Wiss. Beitr. Univ. Halle 11: 16–22.
- GÖRS J. (1966): In den kleinkarpatischen Weingebieten. – Acta Fac. Rerum Nat. Univ. Comen., Ser. Bot. 28: 19-36.
- HAJDUK J. (1966): Vplyv fluórových exhaláčnych splodín na rastlinné spoločenstvá a jednotlivé rastliny okolo závodu na výrobu hliníka. – In: RUŽIČKA M. [ed.]: Problémy znečisťovania ovzdušia. – Vydav. SAV Bratislava p. 40–49.
- HEJNÝ S. & KROPÁČ Z. (1995): Třída: Chenopodietea BR.-BL. in BRAUN-BLANQUET, ROUSSINE & NEGRE 1952 em. LOHMEYER, J. & R. TÜXEN ex MATUSZKIEWICZ 1962. – In: MORAVEC, J. [ed.] Rostlinná společenstva České republiky a jejich ohrožení. - 2. vydání. – Severočes. Přír., Příloha 1955, p. 133-141.
- HEJNÝ S., KOPECKÝ K., JEHLÍK V. & KRIPPELOVÁ T. (1979): Přehled ruderálních rostlinných společenstev Československa. – Rozpr. Čs. Akad. Věd, Ř. Mat. Přír. Věd 89/2: 3-100.
- HEJNÝ S., JEHLÍK V., KOPECKÝ K., KROPÁČ Z. & LHOTSKÁ M. (1973): Karantenní plevele Československa. – Stud. Čs. Akad. Věd 8: 9-156.
- HILBERT H. (1968): Príspevok k ekológii burín severnej časti Podunajskej nížiny. – Rigor. pr., PF UJEP Brno, 49 pp.
- HILBIG W. (1962): Vegetationskundliche Untersuchungen in der mitteldeutschen Ackerlandschaft. VII. Die Pflanzengesellschaften der Umgebung von Dehlitz (Saale) – Wiss. Z. Univ. Halle 7: 849-854.
- HILBIG W. (1965): Zur Gliederung und Verbreitung des Aphano-Matricarietum Tx. 1937 in Niederschleisen. – Wiss. Z. Univ. Halle 6: 563–571.
- HILBIG W. (1966): Die bedeutung der Ackerunkrautgesellschaften für die pflanzengeographische Gliederung Thüringens. – Feddes Repert. 2: 108-140.
- HILBIG W. (1967): Die Unkrautbestände der mitteldeutschen Weinberge. – Hercynia N. F. 4: 325–338.
- HILBIG W. (1973): Übersicht über die Pflanzengesellschaften des südlichen Teils der DDR. VII. Die Unkrautvegetation der Äcker, Gärten und Weinberge. – Hercynia N. F. 10: 394-428.
- HILL M. O. (1979): TWINSPLAN: A Fortran program for arranging multivariate data in an ordered two-way table by classification of the individuals and attributes. – Cornell University, Ithaca, N.Y.
- HOFMEISTER H. (1975): Ackerunkrautgesellschaften des ostbraunschweigischen Hügellandes. – Flor.-soz. Arbeitsgem. N. F. 18: 25-39.
- HOFMEISTER H. (1981): Ackerunkraut-Gesellschaften des Mittelleine-Innerste-Berglandes (NW Deutschland). – Tüxenia 1: 49-62.

- HOFMEISTER H. & GARVE E. (1983): Lebensraum Acker. Pflanzen der Äcker und ihre Ökologie. – 2. Aufl. Verlag Paul Parey, Hamburg u. Berlin, pp. 252.
- HOLUB J., HEJNÝ S., MORAVEC J. & NEUHÄUSEL R. (1967): Übersicht der höheren Vegetationseinheiten der Tschechoslowakei. – Rozpr. Čs. Akad. Věd, Ser. Math. - Natur. 77: 1-75.
- HÜPPE J. & HOFMEISTER H. (1990): Syntaxonomische Fassung und Überblick über die Ackerunkrautgesellschaften in der Bundesrepublik Deutschland. – Ber. RTG 2: 61-81.
- JAGE H. (1972): Ackerunkrautgesellschaften der Dübener Heide und des Flämings. – Hercynia N. F. 9: 317-391.
- JAROLÍMEK I. & SCHLOSSER G. (1997): FYTOPACK - a system of programs to process phytosociological tables. – Biológia 52: 53-59.
- JAROLÍMEK I., ZALIBEROVÁ M., MUCINA L., & MOCHNACKÝ, S. (1997): Rastlinné spoločenstvá Slovenska. 2. Synantropná vegetácia. – VEDA SAV, Bratislava, 416 pp.
- JEHLÍK V. (1980): Die Verbreitung von *Lactuca tatarica* in der Tschechoslowakei und Bemerkungen zu ihrem Vorkommen. – Preslia 52: 209-216.
- JEHLÍK V. (1998): Cizí extenzivní plevele České republiky a Slovenské republiky. – Academia, Praha, 508 pp.
- JURKO A. (1964): Príspevok k burinovým spoločenstvám východoslovenských viníc. – Biológia 19: 871-873.
- KOJIĆ M. (1973): Pflanzengeographische und syntaxonomische Gliederung der Unkrautgesellschaften in Jugoslawien. – Probleme der Agrobotanik, Halle / Saale, p. 38-45.
- KRIPPELOVÁ T. & KRIPPEL E. (1955): Semena burín. Bratislava, 281 pp.
- KRIPPELOVÁ T. & KRIPPEL E. (1956): Vegetačné pomery Záhoria. I. Viate piesky. – Vydavateľstvo SAV, Bratislava, 89 pp.
- KRIPPELOVÁ T. [ed.] 1974: Synantropná flóra a vegetácia, referáty zo sympózia (27.-29.3.1973). – Acta Inst. Bot. Acad. Sci. Slov., Ser. A 1: 1-305.
- KRIPPELOVÁ T. (1975): Prehľad výskumu synantropnej flóry a vegetácie na Slovensku. – Biológia 30: 326-328.
- KRIPPELOVÁ T. [ed.] 1978: Synantropná flóra a vegetácia, referáty zo sympózia (13.-17.9.1976). – Acta Inst. Bot. Acad. Sci. Slov., Ser. A 3: 1-503.
- KRIPPELOVÁ T. (1984): Prehľad výskumu burinových spoločenstiev na Slovensku do roku 1983 (triedy Secalietea a Chenopodietea). – Preslia 56: 229-240.
- KRIPPELOVÁ T. (1981): Synanthrophe Vegetation des Beckens Košická kotlina. - Vegetácia ČSSR, Ser. B, Bratislava, 4: 1-216.
- KRIPPELOVÁ T. & MUCINA L. (1988): Charakteristika vyšších syntaxónov triedy Stellarietea mediae na Slovensku. – Preslia 60: 41-58.
- KRIPPELOVÁ T. & ŠPÁNIKOVÁ A. (1963): Nové lokality niektorých zriedkavejšie sa vyskytujúcich rastlín na Slovensku. – Biológia 18: 525-527.
- KROPÁČ Z. (1974): Příspěvek k poznání plevelových společenstev některých částí Slovenska. – Acta Inst. Bot. Acad. Sci. slovacae, Ser. A 1: 255-268.
- KROPÁČ Z. (1981): Přehled plevelových společenstev ČSSR. – Zpr. Čs. Bot. Společn., Mater. 2, 16: 115-128.
- KROPÁČ Z. (1983): Třída: Secalietea BR.-BL. in BRAUN-BLANQUET, ROUSSINE & NEGRE 1952 - plevelová společenstva polních kultur. – In: MORAVEC J. [ed.]: Rostlinná společenstva České socialistické republiky a jejich ohrožení. – Severočes. Přír., Příloha 1: 103-105.
- KROPÁČ Z. (1997): Současný stav syntaxonomické syntézy segetálních společenstev na území České republiky. – Zprávy Čes. Bot. Společ. 32, Mater. 15: 69-81.

- KROPÁČ Z. & HEJNÝ, S. (1975): Two new segetal associations: Misopateto-Galeopsietum ladani and Consolido regalis-Misopatetum. – *Preslia* 47: 31-57.
- KROPÁČ Z. & MOCHNACKÝ S. (1990): Consolido-Anthemidetum austriacae - a new segetal association. – *Preslia* 62: 103 -130.
- MAGIC D. [ed.] (1971): Zborník prednášok zo zjazdu SBS (Tisovec 5.-11. júl 1970). – *Slov. Bot. Spol.* II. p. 287-638.
- MAGLOCKÝ Š. & FERÁKOVÁ V. (1993): Red list of ferns and flowering plants (Pteridophyta and Spermatophyta) of the flora of Slovakia (the second draft). – *Biológia* 48: 361-385.
- MARHOLD K. & HINDÁK F. [eds.] (1988): Zoznam nižších a vyšších rastlín Slovenska. – Checklist of non-vascular and vascular plants of Slovakia – VEDA, vydavateľstvo SAV, Bratislava, 687 pp.
- MEISEL K. (1967): Über die Artenverbindungen des Aphanion arvensis J. & R. TÜXEN 1960 in west- und nordwestdeutschen Flachland. – *Schriftenr. Vegetationskd.* 2: 123-135.
- MEISEL K. (1981): Ackerunkrautgesellschaften. – In: BOHN, U.: Vegetationskarte der Bundesrepublik Deutschland 1:200000. Potentille natürliche Vegetation. – *Vegetationskd.* 6: 46 – 57.
- MICHALKO J., BERTA J. , MAGIC, D. & al. (1986): Geobotanická mapa ČSSR. Slovenská socialistická republika. – VEDA, vydavateľstvo SAV, Bratislava, 167 pp.
- MIRKIN B. M., ABRAMOVA L. M., ÍSBIDRIN A. R., RUDAKOV K. M. & CHAZAJAJEV, F. CH. (1985): Segetal'nye soobščestva Baškirii. – *Acad. Nauk ZSSR*, Ufa, p. 93-99.
- MOCHNACKÝ S. (1982): Burinové spoločenstvá Východoslovenskej nížiny. – Záverečná správa, mscr. [Depon. in Ústav krajinnej ekológie SAV, Bratislava.]
- MOCHNACKÝ S. (1983): Príspevok k poznaniu segetálnej flóry Východoslovenskej nížiny. - *Zborn. Východoslov. Múz.*, Ser. A 24: 71-82.
- MOCHNACKÝ S. (1984a): Die Ackerunkrautgesellschaften des südlichen Teils der Ostslowakischen Tiefebene. – *Acta Bot. Slov. Acad. Sci. Slov.*, Ser. A, Suppl. 1: 217-237.
- MOCHNACKÝ S. (1984b): Efemérne segetálne spoločenstvá v agrocnózach Východoslovenskej nížiny. – *Zborn. IV. zjazdu Slov. Bot. Spol.*, Nitra, s. 259-265.
- MOCHNACKÝ S. (1984c): Cerastio-Ranunculetum sardoi OBERD. 1957 v agrocnózach na Východoslovenskej nížine. – *Biológia* 39, 5: 507-511.
- MOCHNACKÝ S. (1985a): Segetal vegetation in Agrocnoses of East-Slovak Lowland. -The VII. Internat. Symp. Probl. Land. Ecol. Res., Bratislava, p. 56-64.
- MOCHNACKÝ S. (1985b): Segetálna vegetácia v agrocnózach Východoslovenskej nížiny. -Záverečná správa, mscr. [Depon. in Zoologický ústav SAV, Košice.]
- MOCHNACKÝ S. (1985c): Vzácné a ohrozené druhy segetálnej vegetácie v agrocnózach Východoslovenskej nížiny. – *Pamiatky Príroda*, 5: 35-37.
- MOCHNACKÝ S. (1986a): Veronicetum hederifolio-triphylli. – *Biológia* 41: 439-442.
- MOCHNACKÝ S. (1986b): Segetálna vegetácia v sídlach severozápadnej časti CHKO Východné Karpaty. – *Zborn. X. Východoslov. TOP.*, Krajná Bystrá, p. 151-156.
- MOCHNACKÝ S. (1987): Burinové spoločenstvá v agrocnózach Východoslovenskej nížiny. – Kandidátska dizertačná práca, mscr. [Depon. in Botanický ústav SAV, Bratislava.]
- MOCHNACKÝ S. (1988): Syntaxonomický prehľad burinových spoločenstiev Východoslovenskej nížiny. – *Biológia* 43, 9: 799-802.
- MOCHNACKÝ S. (1989): Cannabio ruderalis-Silenetum noctiflorae SCHUBERT & al. 1981. - *Biológia* 44: 77-81.
- MOCHNACKÝ S. (1996a): Slovákia gymnovénytársulásai. – *Gyomosodás és a modern kőnyezetgazdálkodás. Gődöllő*, p. 74-79.

- MOCHNACKÝ S. (1996b): Survey of synanthropic plant species of town Prešov. – Gyomodás és a modern környezetgazdálkodás. Gödöllő, p. 88-94.
- MOCHNACKÝ S. (1996c): A contribution to the study of segetal communities of Slovakia. – In: Terpó A. & Mochnacký S. [eds.]: II. Anthropization and Environment of rural settlements. Flora and Vegetation. Tarcál-Tokaj, p. 12–13.
- MOCHNACKÝ S. (1999a): A Kelet-szlovákiai táj vesznosítása legeltetéses állattartással. – In: HORVÁTH J. (1999): Szlovákia szegetális növényállományai mint a mezőgazdasági vidékek tájalkotó elemei. – A táj változásai a Kárpát-medencében, Nyíregyháza, p. 41-44.
- MOCHNACKÝ S. (1999b): Segetal communities of Slovakia. – In: MOCHNACKÝ, S. & TERPO, A. [eds.]: III. Anthropization and Environment of rural settlements. Flora and Vegetation. Zemplínska Šírava, p. 20–23.
- MORARIU I. (1943): Asotiații de plante antropofile din jurul Bucureștilor cu observații asupra răspândirii lor în țara și mai ales în Transilvania. – Bul. Grad. Bot. Univ., Cluj, 23: 131-212.
- MORAVEC J. & al. (1995): Rostlinná společenstva České republiky a jejich ohrožení. – Ed. 2., Severočes. Přír., suppl. 1995, 296 pp.
- MUCINA L., KRIPPELOVÁ T., ZALIBEROVÁ M. & KLOTZ S. [eds.] (1984): Proceedings of the 4<sup>th</sup> Symposium on Synanthropic Flora and Vegetation. – Acta Bot. Slov. Acad. Sci. Slov., Suppl. 1: 1-362.
- MUCINA L. (1993): Stellarietea mediae. – In: MUCINA L., GRABHERR G. & ELLMAUER T. [eds.] Die Pflanzengesellschaften Österreichs. Teil I. Anthropogene Vegetation. p. 110-168.
- MUCINA L. & MAGLOCKÝ S. [eds.] & al. (1985): A list of vegetation units of Slovakia. – Doc. Phytosociol., Camerino, N. S., 9: 175-220.
- MÜLLER G. (1964): Die Bedeutung der Ackerunkrautgesellschaften für die pflanzengeographische Gliederung West- und Mitteldeutschlands. – Hercynia N. F. 1: 82-166.
- NEUHÄUSLOVÁ-NOVOTNÁ Z. (1968): Beitrag zur den floristisch-phytozoologischen Verhältnissen der Gegend von Lučenec. – Biol. Pr. 14 / 4: 3-70.
- NEUHÄUSLOVÁ Z. & KOLBEK J., [eds.] (1982): Seznam vyšších rostlin, mechorostů a lišejníků střední Evropy užitých v bance geobotanických dat BÚ ČSAV. – Botanický ústav ČSAV, Průhonice. 224 pp.
- NEZADAL W. (1975): Ackerunkrautgesellschaften Nordostbayerns. – Hoppea 34: 17-149.
- OBERDORFER E. (1954): Über Unkrautgesellschaften der Balkanhalbinsel. – Vegetatio 4: 379-411.
- OBERDORFER E. (1957): Süddeutsche Pflanzengesellschaften. – Pflanzensoc. 10: 1-564.
- OBERDORFER E. (1983b): Süddeutsche Pflanzengesellschaften. Teil III. 2. Aufl. Stuttgart.
- OPLUŠTILOVÁ T. (1948): Burinová vegetácia okolia Bratislavy. – Čs. Bot. Listy 1: 32-34.
- OPLUŠTILOVÁ T. (1953): Ekológia burín v obilninách. – Vydavateľstvo SAV, Bratislava, 158 pp.
- OSVAČILOVÁ V. (1955): Príspevek ke květeně Nitranského kraje. – Preslia 27: 285-286.
- OSVAČILOVÁ V. & SVOBODOVÁ Z. (1961): Floristicko-fytocenologický výskum Nitrianskeho kraja. – Záver. správa. [Depon. in Vys. škola poľnohospodárska, Nitra.]
- PASSARGE H. (1964): Pflanzengesellschaften des norddeutschen Flachlandes I. Pflanzensoz. 13, Jena.
- PASSARGE H. & JURKO A. (1975): Über Ackerunkrautgesellschaften im nordslowakischen Bergland. – Fol. Geobot. Phytotax. 10: 225-264.
- PASSARGE H. (1978): Bemerkungswerte Pflanzengesellschaften im märkischen Gebiet. – Gleditschia 6: 193-208.

- PODANY J. (1990): SYN-TAX IV. Computer programs for data analysis in ecology and systematics on IBM-PC and Macintosh computers. Unido Int. Ctr. Sci. & High Technol., Trieste.
- POLI E. (1966): Eine neue Eragrostidion-Gesellschaft der Citrus-Kulturen in Sizilien. – In: TÜXEN, R. [ed.] Anthropogene Vegetation, p. 60-74.
- Pott R. (1992): Die Pflanzengesellschaften Deutschlands. Ullmer, Stuttgart, 427pp.
- RÁCZ J. (1955): Príspevok k ekologickej amplitúde poľnohospodárskych burín. – Vlast. Sborn., Košice, 1: 242-274.
- RÁCZ J. (1956): Výskum burín na Slovensku. – Naša veda, Bratislava, 3 (8): 355-361.
- RÁCZ J. (1959): K otázke vzájomných vzťahov medzi kultúrnymi rastlinami a burinami. – Biol. práce SAV, V/3, Bratislava.
- RÁCZ J. (1962): Buriny obilnín Bardejovského okresu. – Sborn. Pedagog. Inštit. Prešov a Košice 1: 168-194.
- SCHUBERT R. & MAHN E. G. (1968): Übersicht über die Ackerunkrautgesellschaften Mitteldeutschlands. – Feddes Repert. 2-3: 133-304.
- SCHUBERT R., JÄGER E. J. & MAHN E. G. (1981): Vergleichende geobotanische Untersuchungen in der Baschkirischen ASSR. 2. Teil: Xerotherme Gebüsche, Xerothermrassen, Ackerunkrautgesellschaften. – Wiss. Z. Univ. Halle, 30, 5: 89-113.
- SLAVNIČ Ž. (1951): Pregled nitrofile vegetacije Vojvodine. – Nauč. Zborn. Matice Srpske, Ser. Natur. 1: 84-169.
- Soó R. (1957): Systematische Übersicht der Pannonischen Pflanzengesellschaften I. – Acta Sci. Hung. 3: 317-373.
- Soó R. (1964): A magyar flóra és vegetáció. Rendszertaninövényfölrajzi kézikönyve I. Akadémiakiadó, Budapest, 589 pp.
- STANO V. (1980a): Vegetačná charakteristika HSA Košice. Segetálne spoločenstvá okopanín. – Rádioaktivita a životné prostredie 3: 313-320.
- STANO V. (1980b): Burinná vegetácia obilnín a okopanín v okolí obce Hybe vo východnej časti Liptovskej kotliny. – Diplomová práca, mscr. [Depon. in PrF UK, Bratislava.]
- TIMÁR L. (1957): Zónologische Untersuchungen in den Äckern Ungarns. – Acta Bot. Acad. Sci. Hung. 3: 79-103.
- TONČIKOVÁ D. (1980): Segetálne spoločenstvá Silickej planiny. – Diplomová práca, mscr. [Depon. in PrF UK, Bratislava.]
- TOPIC J. (1978): Fitocenolóska istraživanja korovne vegetacije okopavina istočne Podravine (Croatia). – Acta Bot. Croat. 37: 149-157.
- TÜXEN R. (1937): Die Pflanzengesellschaften Nordwestdeutschlands. – Mitt. Florist.-Soziol. Arbeitsgem. 3: 1-171.
- TÜXEN R. (1950): Grundriss einer Systematik der nitrophilen Unkrautgesellschaften in der Eurosibirischen Region Europas. – Mitt. flor.-soz. Arbeiten. , N. F. Stolzenau/Weser, 2: 94-175.
- VALACHOVIČ M., OŤAHEĽOVÁ H., STANOVÁ V. & MAGLOCKÝ Š. (1995): Rastlinné spoločenstvá Slovenska. 1. Pionierska vegetácia. Veda, vydavateľstvo SAV, Bratislava, 184 pp.
- VAN DER MAAREL E. (1979): Transformation of cover-abundance values in phytosociology and its effects on community similarity. – Vegetatio 39: 97-114.
- VILČEKOVÁ P. (1981): Unkrautgesellschaften des Verbandes Fumario-Euphorbion GÖRS 1966 in den klein karpatischen Weingebieten. – Acta Fac. Rerum Nat. Univ. Comen., Ser. Bot. 28: 19-36.
- WARCHOLINSKA A. U. (1974): Zbiorowiska chwastów segetaknych Równiny Piotrkowskiej i ich współczesne przemiany w związku z intensyfikacją rolnictwa (Mezoregion Nizin Środkowopolskich). – Acta Agrobot., 27/2: 95-194.

- WARCHOLINSKA A. U. (1990): Numerical classification of segetal communities of the Łódź Elevations. – Acta Univ. Lodz, 212 pp.
- WESTHOFF V. & VAN DER MAAREL E. (1978): The Braun-Blanquet approach. – In: WHITTAKER, R.H. [eds.] Classification of plant communities, p. 287-399.
- WNUK Z. (1976): Zbiorowiska chwastow segetalnych pasma Przedborsko – Malogoskiego i przyleglych terenow. Cześć I. Zbiorowiska upraw okopowych. – Acta Univ. Lodz., Ser. Mat. - Natur. 14: 85-122.
- WÓJCIK Z. (1980): Plant communities of mazovian cultivated fields. Part III. – Pol. Ecol. Stud. 3: 545-569.
- ZÁHRADNÍKOVÁ-ROŠETZKA K. (1955): Predbežný fytoocenologický náčrt burín v okopninách v okolí Trnavy. – Biológia 10: 277-284.
- ZALIBEROVÁ M. & JAROLÍMEK I. (1995): Ruderal plant communities of north-eastern Slovakia I. Artemisietea, Galio-Urticetea, Bidentetea. – Thaiszia - J. Bot. 5: 31-59.
- ZALIBEROVÁ M., JAROLÍMEK I., SCHWARZOVÁ T., ŠČEPKA A., KRIPPELOVÁ T. & DÚBRAVCOVÁ, Z. [eds.] 1988: Symposium Synanthropic Flora and Vegetation V, Proceedings of the 5th Symposium. Martin. 358 pp.

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