



## NOTES ON ANTHROPOHILOUS FLORA AND VEGETATION IN THE CITY OF TIMISOARA

Ioan COSTE, G.-Gabriel ARSENE

University of Agricultural Sciences - Timisoara

### **Abstract:**

*We present the spontaneous flora and vegetation in the city of Timisoara on the ground of our own researches made by the phytosociological method. Vegetal associations that occupy the largest areas and that are most frequent are Trifolium repenti - Lolietum perennis and Lolio - Plantaginetum majoris. We have also detected a concentrical zoning of vegetation from downtown to uptown. We point out vascular plant species whose presence has an impact on urban environment quality, especially allergy-generating plants (e.g. Ambrosia artemisiifolia). Researches have also underlined some new species not mentioned in literature about flora of the Timisoara city.*

### **Keywords:**

flora, vegetation, urban environment quality, *Ambrosia artemisiifolia*, *Panicum dichotomiflorum*.

### **1. Introduction**

Timișoara is the largest cities in southwestern Romania. Situated in the Banat's Plain, at an altitude of 80-90 m, the city has a moderate continental climate with mean yearly temperatures of 10.9<sup>0</sup> C and mean rainfalls of about 630 mm. During the last 10 years, there have been great variations both in temperature and rainfall. The soil is of the leached chernozem type, with great *intra muros* changes due to building and infrastructure maintenance activities.

Spontaneous flora and vegetation of the city have been little studied [3, 4], as they have been maybe considered dull. Nevertheless, anthropophilous vegetation has a great impact on urban ambiance at least from an aesthetic and humans' health points of view [1]. In addition, phytocenoses occupying ruderal habitats (*sensu* Grimme, 1979) represent good study models of the first steps of vegetation dynamics.

The data in the present paper have been collected during the years 1999-2002. They are a picture of synanthropic flora and vegetation

biodiversity and offer good hints for occasional maintenance measures of the urban environment.

## 2. Material and Methods

Field research was done on spontaneous phytocenoses in the following types of stations: lanes, roadsides, ditch sides, spaces between roads and sidewalks, slopes, railway and tramway roads, un-worked lawns. According to urban subsystem classifications [8], the areas we surveyed are mainly within the following subsystems:

- grouped buildings, characteristic of the first half of the 20<sup>th</sup>;
- industrial and warehousing sites, with different buildings and facilities separate by relatively wide spaces;
- residential areas.

The floral compendium was defined by marking species we came across in the different tras-sections but also by reuniting all the species we met in the field.

Vegetation study was done with the method og phytosociological land survey [2]. The main features of the method we appllied are:

- variable size of samples (2-100 m<sup>2</sup>), due to field conditions;
- awarding each species an abundance-dominance grade according to the Braun-Blanquet scale (1964), from „+” to „5” and a local frequency grade on a scale from „1” to „5”;
- average height and general coverage of the vegetal cover (visual assessments in %);
- land survey data were gathered in phytosociological synthetic tables.

Vegetation units were identified according to Sanda *et al.* [7] system on the ground of processing with the help of the 105 relévés.

## 3. Flora compendium

**Urticaceae** - *Urtica dioica* L., *Urtica urens* L.; **Polygonaceae** - *Fallopia convolvulus* (L.) A. S. Löve. *Polygonum aviculare* L., *Polygonum hydropiper* L., *Polygonum lapathifolium* L., *Polygonum persicaria* L., *Reynoutria japonica* Houtt., *Rumex acetosella* L., *Rumex crispus* L., *Rumex obtusifolius* L.; **Cannabaceae** - *Humulus lupulus* L.; **Amaranthaceae** - *Amaranthus retroflexus* L.; **Chenopodiaceae** - *Atriplex patula* L., *Atriplex tatarica* L., *Bassia scoparia* (L.) A. J. Scott, *Chenopodium album* L., *Chenopodium hybridum* L., *Chenopodium murale* L., *Chenopodium polyspermum* L.; **Portulacaceae** - *Portulaca oleracea* L.; **Caryophyllaceae** - *Arenaria serpyllifolia* L., *Cerastium arvense* L., *Cerastium glomeratum* Thuill, *Saponaria officinalis* L., *Silene alba* (Mill.) E. H. L. Krause, *Stellaria media* (L.) Vill.; **Ranunculaceae** - *Ranunculus arvensis* L., *Ranunculus ficaria* L., *Ranunculus repens* L., *Ranunculus sardous* Crantz; **Aristolochiaceae** - *Aristolochia clematitis* L.; **Papaveraceae** - *Chelidonium majus* L., *Papaver rhoeas* L.; **Fumaricaceae** - *Fumaria officinalis* L., *Fumaria schleicheri* Soy-Will.;

**Brassicaceae** - *Alliaria petiolata* (M. Bieb.) Cavara & Grande, *Arabidopsis thaliana* (L.) Heynh., *Armoracia rusticana* P. Gaertn., B. Mey & Schreb., *Berteroa incana* (L.) DC., *Capsella bursa-pastoris* (L.) Medik., *Cardaria draba* (L.) Desv., *Descurainia sophia* (L.) Webb. ex Prantl, *Diplotaxis muralis* (L.) DC., *Erophila verna* (L.) Chevall., *Lepidium ruderales* L., *Myagrum perfoliatum* L., *Raphanus raphanistrum* L., *Rorippa austriaca* (Crantz) Besser, *Rorippa sylvestris* (L.) Besser, *Sinapis arvensis* L., *Sisymbrium orientale* L., *Thlaspi arvense* L., *Thlaspi perfoliatum* L.; **Resedaceae** - *Reseda lutea* L.; **Violaceae** - *Viola arvensis* Murray, *Viola elatior* Fr., *Viola odorata* L.; **Rosaceae** - *Geum urbanum* L., *Potentilla anserina* L., *Potentilla argentea* L., *Potentilla reptans* L., *Prunus cerasifera* Ehrh., *Prunus spinosa* L., *Rosa canina* L., *Rubus caesius* L., **Fabaceae** - *Astragalus glycyphyllos* L., *Coronilla varia* L., *Lathyrus sativus* L., *Lathyrus tuberosus* L., *Lotus corniculatus* L., *Medicago lupulina* L., *Medicago sativa* L., *Medicago sativa* L. subsp. *falcata* (L.) Arcang., *Melilotus alba* Medik., *Melilotus officinalis* (L.) Pall., *Robinia pseudacacia* L., *Trifolium arvense* L., *Trifolium campestre* Schreb., *Trifolium pratense* L., *Trifolium repens* L., *Vicia cassubica* L., *Vicia cracca* L., *Vicia grandiflora* Scop., *Vicia lathyroides* L., *Vicia sativa* L., *Vicia tetrasperma* (L.) Schreb.; **Primulaceae** - *Lysimachia numularia* L.; **Zygophyllaceae** - *Tribulus terrestris* L.; **Malvaceae** - *Abutilon theophrasti* Medik., *Althaea officinalis* L., *Hibiscus trionum* L., *Malva neglecta* Wallr., *Malva pusilla* Sm., *Malva sylvestris* L.; **Oxalidaceae** - *Oxalis acetosella* L., *Oxalis corniculata* L., *Oxalis stricta* L.; **Geraniaceae** - *Erodium cicutarium* (L.) L'Her., *Geranium dissectum* L., *Geranium pratense* L., *Geranium pusillum* L.; **Vitaceae** - *Parthenocissus quinquefolia* (L.) Planch.; **Apiaceae** - *Anthriscus cerefolium* (L.) Hoffm., *Anthriscus sylvestris* (L.) Hoffm., *Conium maculatum* L., *Coriandrum sativum* L., *Daucus carota* L., *Eryngium campestre* L., *Pastinaca sativa* L., *Torilis arvensis* (Huds.) Link.; **Euphorbiaceae** - *Euphorbia cyparissias* L., *Euphorbia maculata* L.; **Caprifoliaceae** - *Sambucus ebulus* L.; **Valerianaceae** - *Valerianella locusta* (L.) Laterr.; **Apocynaceae** - *Vinca minor* L.; **Convolvulaceae** - *Calystegia sepium* (L.) R. Br., *Convolvulus arvensis* L.; **Cuscutaceae** - *Cuscuta europaea* L.; **Boraginaceae** - *Cynoglossum officinale* L., *Echium vulgare* L., *Myosotis arvensis* (L.) Hill, *Symphytum officinale* L.; **Solanaceae** - *Lycium barbarum* L., *Solanum dulcamara* L., *Solanum nigrum* L.; **Scrophulariaceae** - *Linaria vulgaris* Mill., *Verbascum blattaria* L., *Verbascum phlomoides* L., *Veronica chamaedrys* L., *Veronica hederifolia* L., *Veronica persica* Poir.; **Verbenaceae** - *Verbena officinalis* L.; **Lamiaceae** - *Ajuga genevensis* L., *Ajuga reptans* L., *Ballota nigra* L., *Glechoma hederacea* L., *Lamium amplexicaule* L., *Lamium purpureum* L., *Leonurus cardiaca* L., *Lycopus europaeus* L., *Mentha arvensis* L., *Mentha longifolia* (L.) Huds., *Prunella vulgaris* L., *Salvia nemorosa* L., *Salvia pratensis* L., *Stachys annua* (L.) L., **Dipsacaceae** - *Knautia arvensis* (L.) Coult., *Scabiosa ochroleuca* L.; **Cucurbitaceae** - *Bryonia cretica* L. subsp. *dioica* (Jacq.) Tutin; **Plantaginaceae** - *Plantago lanceolata* L., *Plantago major* L., *Plantago media* L.; **Rubiaceae** - *Galium album* Mill., *Galium aparine* L., *Galium tricornutum* L., *Galium verum* L.; **Asteraceae** - *Achillea millefolium* L.,

*Achillea setacea* Waldst. & Kit., *Ambrosia artemisiifolia* L., *Anthemis arvensis* L., *Anthemis austriaca* Jacq., *Arctium lappa* L., *Artemisia vulgaris* L., *Bellis perennis* L., *Bidens tripartita* L., *Carduus acantoides* L., *Carduus nutans* L., *Centaurea biebersteinii* DC., *Centaurea scabiosa* L., *Chamomilla recutita* (L.) Rauschert, *Chamomilla suaveolens* (Pursh) Rydb., *Chondrilla juncea* L., *Cichorium intybus* L., *Cirsium arvense* L., *Cirsium vulgare* (Savi) Ten., *Conyza canadensis* (L.) Cronquist, *Crepis foetida* L., *Crepis setosa* Haller f., *Erigeron annuus* (L.) Pers., *Galinsoga parviflora* Cav., *Helianthus tuberosus* L., *Inula hirta* L., *Lactuca serriola* L., *Leontodon hispidus* L., *Matricaria perforata* Merat, *Onopordum acanthium* L., *Picris hieracioides* L., *Senecio vernalis* Waldst. & Kit., *Senecio vulgaris* L., *Solidago canadensis* L., *Sonchus arvensis* L., *Sonchus asper* (L.) Hill, *Tanacetum vulgare* L., *Taraxacum officinale* Webber, *Tragopogon pratensis* L., *Tussilago farfara* L., *Xanthium spinosum* L., *Xanthium strumarium* L., *Xanthium strumarium* L. subsp. *italicum* (Moretti) D. Löve; **Juncaceae** - *Juncus inflexus* L.; **Lemnaceae** - *Lemna minor* L.; **Liliaceae** - *Gagea arvensis* (Pers.) Dumort., *Gagea lutea* (L.) Ker Gawl., *Ornithogalum pyramidale* L.; **Iridaceae** - *Iris graminea* L., *Iris pseudacorus* L.; **Cyperaceae** - *Carex hirta* L., *Carex vulpina* L.; **Poaceae** - *Agrostis stolonifera* L., *Alopecurus pratensis* L., *Arrhenatherum elatius* (L.) P. Beauv. ex J. Presl. & C. Presl., *Avena fatua* L., *Bromus arvensis* L., *Bromus commutatus* Schrad., *Bromus hordeaceus* L., *Bromus inermis* Leyss., *Bromus sterilis* L., *Bromus tectorum* L., *Calamagrostis epigejos* (L.) Roth., *Cynodon dactylon* (L.) Pers., *Dactylis glomerata* L., *Digitaria sanguinalis* (L.) Scop., *Echinochloa crus-galli* (L.) P. Beauv., *Elymus repens* (L.) Gould., *Eragrostis cilianensis* (All.) F. T. Hubb., *Eragrostis minor* Host., *Festuca pratensis* Huds., *Festuca pseudovina* Hack. ex Wiesb., *Festuca rupicola* Heuff., *Hordeum murinum* L., *Lolium perenne* L., *Panicum dichotomiflorum* Michx., *Panicum miliaceum* L., *Poa annua* L., *Poa bulbosa* L., *Poa pratensis* L., *Poa trivialis* L., *Sclerochloa dura* (L.) P. Beauv., *Setaria pumila* (Poir.) Schult., *Setaria verticillata* (L.) P. Beauv., *Setaria viridis* (L.) P. Beauv., *Sorghum halepense* (L.) Pers.

#### 4. Main vegetation units compendium

*Stellarietea mediae* R. Tx., Lohm & Prsg. in R. Tx. 1950

*Eragrostetalia* J. Tx. ex Poli 1966

*Amarantho* - *Chenopodion* Morariu 1943

*Amarantho* - *Chenopodietum albi* Morariu 1943

*Portulacetum oleracei* Felföldy 1942

*Tribulo* - *Tragetum* Soo & Timar in Timar 1954

*Sisymbrietalia* J. Tx. in Lohm et al. 1962

*Sisymbrium officinalis* R. Tx., Lohm. & Prsg. in R. Tx. 1950

*Erigeronto* - *Lactucetum serriolae* Lohm. in Oberd. 1957

*Brometum arvensi* (Șerbănescu 1957) Kiss 1964

*Hordeetum murini* Libbert 1932 em. Pass. 1964

*Plantaginetea majoris* Tx. & Prsg. 1950

*Plantaginetalia majoris* Tx. (1947) 1950

- Polygonion avicularis* Br.-Bl. 1931 em. Tx. 1950  
*Lolio – Plantaginetum majoris* (Linkola 1921) Beger 1950  
*Poëtum annuae* Gams 1927  
*Sclerochloo – Polygonetum avicularis* (Gams 1927) Soo 1940
- Artemisieta vulgaris* Lohm et al. in Tx. 1950  
*Onopordetalia acanthii* Br.-Bl. & R. Tx. ex Klika & Hadac 1944  
*Onopordion acanthii* Br.-Bl. et al. 1936  
*Onopordetum acanthii* Br.-Bl. et al. 1936  
*Ambrosietum artemisiifoliae* Vițălariu 1973  
*Dauco – Melilotion* Görs 1966  
*Conietum maculati* I. Pop 1968  
*Agropyretalia repentis* Oberd. et al. 1967  
*Convolvulo – Agropyron* Görs 1966  
*Convolvulo – Agropyretum repentis* Felföldy 1943
- Molinio – Arrhenatheretea* Tx. 1937  
*Arrhenatheretalia* Pawl. 1928  
*Cynosurion* R. Tx. 1947  
*Trifolio repenti – Lolietum* Krippelova 1967

## 5. Conclusions

1. Spontaneous flora under survey is made up of over 250 species of cormophytous, most of which are ruderal and segetal weeds, sometimes accompanied by a few sub-spintaneous species.
2. We therefore confirm the presence of the *Panicum dichotomiflorum* Michx species [4] of which a population was identified at the North Station.
3. The spreading of the *Ambrosia artemisiifolia* L. species is of great concern, as its pollen is highly allergenic [5]. As we have seen, this species spreads very rapidly and makes up compact phytocenoses surrounded by a self-sustaining association (*Ambrosietum artemisiifoliae* Vițălariu 1973).
4. The vegetation under survey proves to be a rich one if we take into account the number of identified vegetal associations, but some associations are represented by phytocenoses that occupy small areas. The most widespread associations are on lawns *Trifolio repenti – Lolietum Krippelova* 1967 and *Lolio – Plantaginetum majoris* (Linkola 1921) Beger 1950, and on lanes *Convolvulo – Agropyretum repentis* Felföldy. On dried soils (and enhanced by the droughts in the last few years) we came across cenoses of *Hordeetum murini* Libbert 1932 em. Pass. 1964. on lanes we identified during the first stages of succession associations of *Stellarietea mediae* E. Tx., Lohm & Pesg. in R. Tx. 1950, almost identical to those on abandoned agricultural lands.

## 5. References

1. Booth, B. D., Murphy, D. S., Swanton, C. J. – *Weed Ecology in Natural and Agricultural Ecosystems*, CAB International, 2003
2. Borza, A., Boşcaiu, N. – *Introducere în studiul covorului vegetal*, Ed. Academiei RSR, Bucureşti, 1965
3. Bujoreanu, G. – *Contribuție la flora Timișoarei*, Buletinul Grădinei Botanice dela Universitatea din Cluj la Timișoara, XXII, pp. 77-96, 1942
4. Coste, I., - *Recherches sur la flore anthropophile adventive de la Plaine du Banat*, Lucrări Științifice USAMVB Timișoara, Facultatea de Agricultură, XXXV, pp. 459-462, 2003
5. Faur, A., Ivanovici, N.- *Dinamica polenului de Ambrosia artemisiifolia*, in *Lucrările Conferinței Naționale de Alergologie și Imunologie Clinică*, 26 – 28 aprilie 2001, Târgu Mureș, 2001
6. Grimme, J. P. – *Plant Strategies and Vegetation Process*, J. Willey & Sons, New York, 1979
7. Sanda, V., Popescu, D., Stancu, I. – *Structura cenotică și caracterizarea ecologică a fitocenozelor din România*, Ed. Conphis, 2001
8. Tüllmann, G., Böttcher, H. – *Synanthropic Vegetation and Structure of Urban Subsystems*, in *Colloques phytosociologiques*, XII, „Végétation nitrophile”, Bailleul, pp. 481-523, 1983
9. \* \* *Flora Europaea Database*, [www.rbg-web2rbge.org.uk/FE/fe.html](http://www.rbg-web2rbge.org.uk/FE/fe.html) accessed at 20.05.2003