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The participation of invasive plants in the synanthropic plant communities in the Bukovinian Cis-Carpathian (Ukraine)

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Abstract: The results of studying the participation of invasive plants in the synanthropic plant communities in the Bukovinian Cis-Carpathians (Chernivtsi Region, Ukraine) are presented. 29 invasive species, including 6 tranformers, were noted in 16 associations from 5 classes: *Polygono arenastri-Poetea annua*, *Stellarietea mediae, Artemisietea vulgaris, Galio-Urticetea*, and *Robinietea*.

Keywords: invasive plants, synanthropic plant communities, Bukovinian Cis-Carpathians, Ukraine.

Introduction

By the end of the 20th century, the invasions of alien species, including plants, widely occurred as one of the major global threats to biodiversity (CHORNESKY & RANDALL 2003; DAVIS 2003; LONSDALE 1999, MOONEY & CLELAND 2001; PROTOPOPOVA et al. 2006; PYŠEK et al. 1995, etc.). Scientists from different countries have accumulated much data proving the negative economic and

ecological consequences of invasions of some of the most aggressive species, and also the cumulative influence of alien plants on the stability and viability of ecosystems that once consisted mostly of native species. At present, the process of naturalization of alien species in natural and semi-natural habitats progresses rapidly. Many invasive plants occur in these habitats, actively participate in successions in disturbed plant communities, and eventually form communities in which alien plants dominate.

Study area

Bukovinian Cis-Carpathians (Chernivtsi Region, Ukraine) (Fig. 1.), is one of the regions of the Carpathian mountain country, with more or less preserved natural plant cover. The regional ecosystems are a heterogenic complex, which includes forest, meadow, meadow-steppe, steppe, river natural vegetation, human–made and human-altered habitats. In the recent years the process of synanthropization of plant cover is increased in the region. According to the physical and geographical zoning of Ukraine (POPOV et al. 1968) the studied area belongs to the region Cis-Carpathia (PryCarparthia – in Ukrainian). This is a first outer region of the Carpathian mountain country, which has clearly defined boundaries: in the North – the river Prut, in the West – the river Cheremosh, in the South – orthographic ledge of the Bukovinian Carpathians, in the South-East – the state border with Romania.

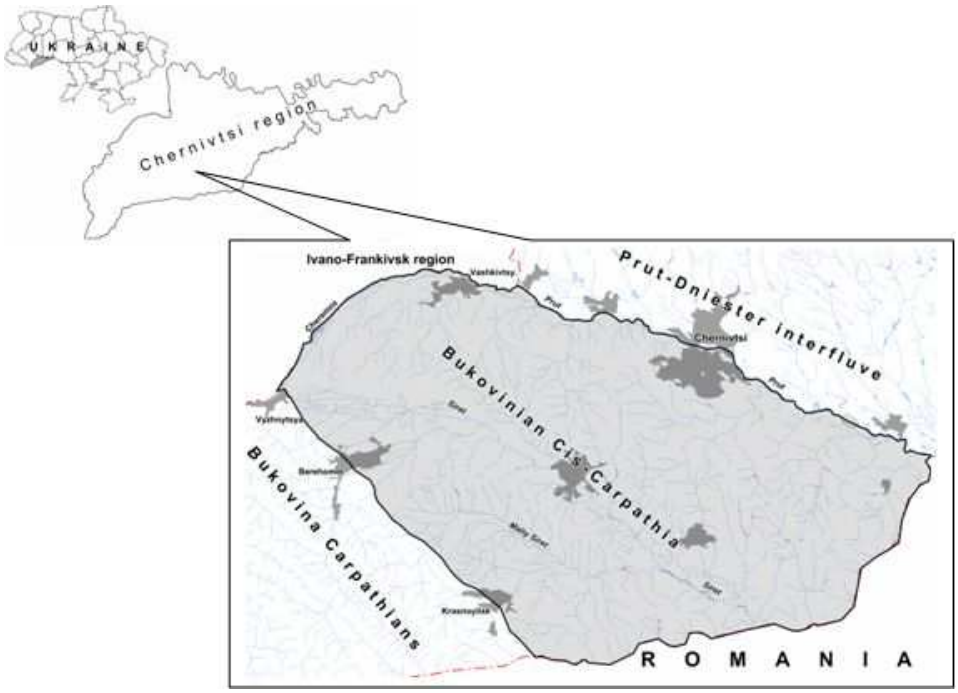

Fig. 1. Map of Bukovinian Cis-Carpathians

The important feature of Bukovinian Cis-Carpathias is that this relatively small area (259.2 hectares) includes different types of relief that characterize large areas of separate continents: plain and mountain.

Methods

The investigations are based on the original materials obtained by route surveys in the Bukovinian Cis-Carpathians during 2007–2012 years. Comparative morphological and geographical methods were used in the present study. The participation of alien species in the plant communities is presented according J. BRAUN-BLANQUET classification. The syntaxonomic scheme of plant communities with participation of invasive plants, prepared on the basis of more than 350 geobotanical descriptions, is described. Invasive species were classified after D. Richardson et al.'s classification [RICHARDSON et al. 2000].

The collections of the Herbarium of Yu. Fedkovych Chernivtsi National University (*CHER*) and the M.G. Kholodny Institute of Botany, National Academy of Sciences of Ukraine (*KW*) were used in the study.

The dot map of distribution of invasive species in the region was prepared based on these herbarium and field data (BUDZHAK et al. 2009).

Results

The alien fraction of Bukovinian Cis-Carpathians flora were consisted of 286 species of vascular plants from 192 genera and 61 families. According to the time of immigration the group is presented by 104 archaeophytes and 182 kenophytes; according to degree of naturalization – 9 agriophytes, 7 agrio-epoecophytes, 172 epoecophytes, 18 colonophytes, and 79 ephemerophytes, and according to geographical origin the species from the Mediterranean (68) and North American (52) prevail, and 33 species from Mediterranean-Iran-Turanian region and other groups are less frequent rare.

We have noted 29 invasion species: **Acer negundo* L., **Ambrosia artemisiifolia* L., *Bunias orientalis* L., *Capsella bursa-pastoris* (L.) Medik., *Cardaria draba* (L.) Desv., *Cichorium intybus* L., *Conyza canadensis* (L.) Cronq., *Echinochloa crusgalli* (L.) P. Beauv., *Echinocystis lobata* (Michx.) Torr. et A. Gray, *Galinsoga parviflora* Cav., *G. urticifolia* (Kunth) Benth., *Geranium sibiricum* L., *Heracleum mantegazzianum* Somm. et Levier, *Impatiens glandulifera* Royle, **I. parviflora* DC., *Juncus tenuis* Willd., *Lamium album* L., **Phalacroloma annuum* (L.) Dumort., *Reynoutria*× *bohemica* Chrtek et Chrtková, *R. japonica* Houtt., *Robinia pseudoacacia* L., **Rudbeckia laciniata* L., *Setaria glauca* (L.) P. Beauv., *Sisyrinchium septentrionale* E.P. Bicknell, **Solidago canadensis* L., *Thladiantha dubia* Bunge, *Verbena officinalis* L., *Xanthium albinum* (Widder) H. Scholz, *Xanthoxalis dillenii* (Jacq.) Holub., including 6 transformers (they are signed by asterisk) (PROTOPOPOVA et al., 2009) in the Bukovinian Cis-Carpathian flora classification of RICHARDSON et al. (2000). The most aggressive invasive species, without species-transformers, were *Conyza canadensis and Echinocystis lobata* (Fig.2–3).

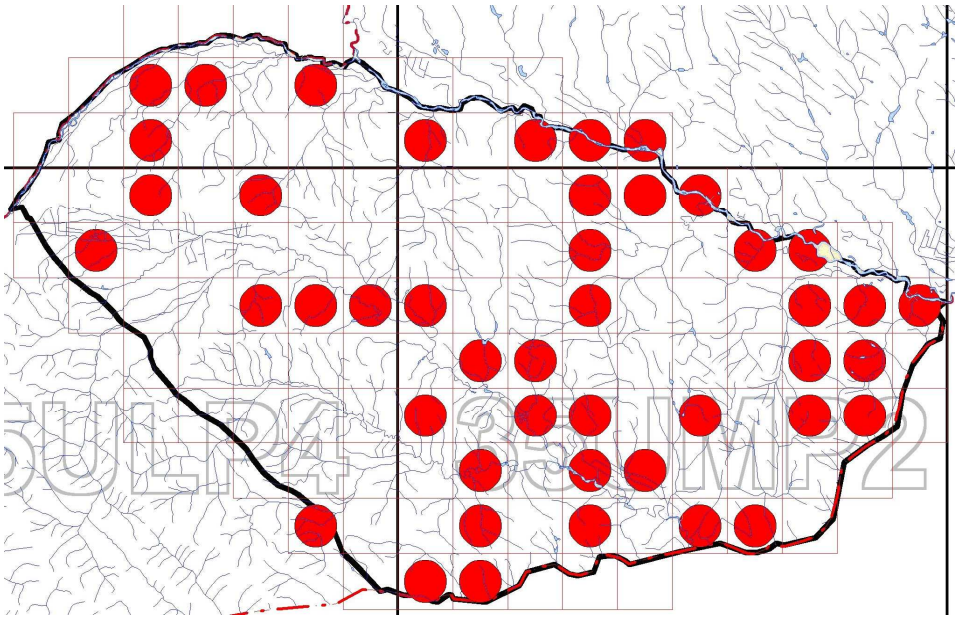

Fig. 2. The map of the distribution of *Conyza canadensis* (L.) Cronq. in the Bukovinian Cis-Carpathians.

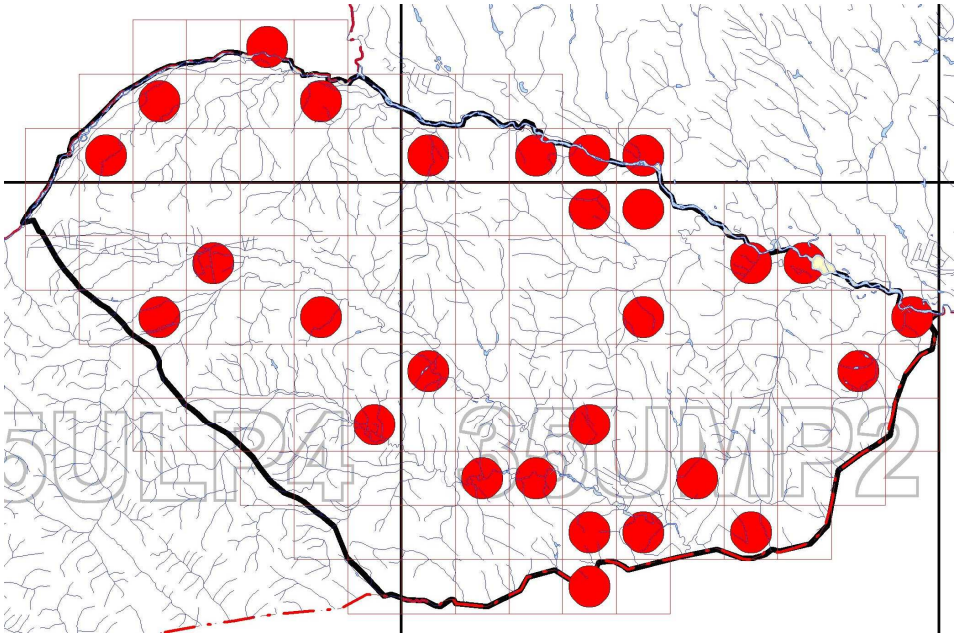

Fig. 3. The map of the distribution of *Echinocystis lobata* (Michx.) Torr. et A. Gray in the Bukovinian Cis-Carpathians

In the article, the results of preliminary study of participation of invasive plants in the synanthropic plant communities in the Bukovinian Cis-Carpathians are presented. The 29 invasive species, including 6 transformers, have been noted in 18 associations from 5 classes. The syntaxanomic scheme of plant community of Bukovinian Cis-Carpathians with participations of invasive species is follow:

Cl. *Polygono arenastri-Poetea annua* Rivas-Martínez 1975 corr. Rivas-Martínez et al. 1991

Ord. *Polygono arenastri-Poetalia annuae* Tx. in Géhu et al. 1972 corr. Rivas-Mart. et al. 1991

All. *Polygono-Coronopodion* Sissingh 1969

Ass. *Polygonetum arenastri* Gams 1927 corr. Lanikova in Chytry 2009

Cl. *Stellarietea mediae* Tx. et al. ex von Rochow 1951

Ord. *Eragrostietalia* J. Tx. ex Poli 1966

All. *Eragrostion cilianensi-minoris* Tüxen ex Oberdorfer 1954

Ass. *Portulacetum oleraceae* Felföldy 1942

Ass. *Eragrostio-Amaranthetum albi* Morariu 1943

Ord. *Sisymbrietalia* J. Tx. ex Görs 1966

All. *Atriplicion* Passarge 1978

Ass. *Ivaetum xanthifoliae* Fijałkowski 1967

Ass. *Artemisietum annuae* Fijałkowski 1967

Ass. *Conyzo canadensis-Lactucetum serriolae* Lohmeyer in Oberdorfer 1957

Ord. *Atriplici-Chenopodietalia albi* (Tx. 1937) Nordhagen 1950

All. *Spergulo arvensis-Erodion cicutariae* J. Tüxen in Passarge 1964

Ass. *Setario pumilae-Echinochloetum cruris-galli* Felföldy 1942 corr. Mucina in Mucina et al. 1993

Cl. *Artemisietea vulgaris* Lohmeyer et al. ex von Rochow 1951

Ord. *Onopordetalia acanthii* Br.-Bl. et Tx. ex Klika et Hadač 1944

All. *Dauco-Melilotion* Görs ex Rostański et Gutte 1971

Ass. *Tanaceto vulgaris-Artemisietum vulgaris* Sissingh 1950

Ass. *Melilotetum albo-officinalis* Sissingh 1950

All. *Onopordion acanthii* Br.-Bl. et al. 1936

Ass. *Berteroetum incanae* Sissingh et Tideman ex Sissingh 1950

Ord. *Agropyretalia intermedio-repentis* Oberd. et al. ex T. Müller et Görs 1969

All. *Convolvulo arvensis-Agropyrion repentis* Görs 1966

Ass. *Convolvulo-Agropyretum repentis* Felföldy 1943

Cl. *Galio-Urticetea* Passarge ex Kopecký 1969

Ord. *Galio-Alliarietalia* Oberd. in Görs et T. Müller 1969

All. *Aegopodion podagrariae* Tx. 1967

Ass. *Chaerophylleto hirsuti-Cirsietum oleracei* Kost. in V.Sl. et al. 1992

Ass. *Chaerophylletum aromatici* Gutte 1963

Ass. *Reynoutrietum japonicae* Görs 1974 corr. Hilbig 1995

Ass. *Urtico dioicae-Heracleetum mantegazzianii* Klauck 1988
All. *Geo-Alliarion* Lohmeyer et Oberdorfer in Görs et T. Müller 1969
Ass. *Sambucetum ebulii* Felföldy 1942
Ord. *Circaeo lutetianae-Stachyetalia sylvaticae* Passarge 1967
All. *Impatienti noli-tangere-Stachyion sylvaticae* Görs ex Mucina 1993
Ass. *Stachyo sylvaticae-Impatientetum noli-tangere* Hilbig 1972
Ord. *Convolvuletalia sepium* Tx. ex Mucina 1993
All. *Senecionion fluviatilis* Tüxen ex Moor 1958
Ass. *Calystegio sepium-Impatientetum glanduliferae* Hilbig 1972
Ass. *Rudbeckio laciniatae-Solidaginetum canadensis* Tüxen et Raabe ex Anioł-Kwiatkowska 1974

Cl. *Robinietea* Jurko ex Hadač et Sofron 1980
Ord. *Chelidonio-Robinietalia* Jurko ex Hadač et Sofron 1980
All. *Chelidonio-Robinion* Hadač et Sofron 1980
Ass. *Impatienti parviflorae-Robinietum* Sofron 1967

Synanthropic plant communities of the class *Polygono arenastri-Poetea annua* are one of resistant to trampling and grazing, concentrated on the disturbed lawns, trails, rural roads and compacted soil and distributed on all territory of Ukraine. We found one association with participation of invasive species in the class in the Bucovinian Cis-Carpathians.

The plant community of association *Polygonetum arenastri* was distributed along the “Glyboka-Bukovynska” railway station and in Chernivtsi (near the road on the Gayova street and in city area “Sadky”, and on the lawn in the Dovbush and Kochubey street). Total projective cover was 90–100%. Species richness of the communities was represented by 46 species, the average number of species were 18. Diagnostic species of associations are *Polygonum aviculare* L. s.str., *Plantago major* L. and *Poa annua* L. We noted the following transformer species *Acer negundo* (j), *Ambrosia artemisiifolia*, *Impatiens parviflora* and *Phalacroloma annuum*, as well as other invasive species *Conyza canadensis*, *Galinsoga urticifolia* in the community.

The plant community of class *Stellarietea mediae* is mainly of anthropogenic origin, concentrated on verge of roads, rubble and abandoned buildings. The class included 7 associations with participation of invasive species in the Bucovinian Cis-Carpathians.

Plant community of association of *Portulacetum oleraceae* was concentrated on inter railways lot with road-metals in Chernivtsi (Chernivtsi-Pivdenna), Storozhynets, Vashkivtsy, Beregomet and Glyboka railways station. Total projective cover of association varied from of 40–50% to 80–90%. The diagnostic species of association are *Portulaca oleracea* L. (50–60%), *Eragrostis minor* Host (30–40%), *Digitaria sanguinalis* (L.) Scop. (20%). In floristic composition of associations noted 46 species (average of the species in the description – 17), including 1 transformer species *Phalacroloma annuum* and invasive species *Conyza canadensis*, *Echinochloa crusgalli*, *Galinsoga parviflora*, *Geranium sibiricum, Xanthoxalis dillenii*.

Plant community after a demutation of plant cover of territories of association *Eragrostio-Amaranthetum albi* was distributed in Storozhynets railway stations, Beregomet and Glyboka on road-metal substrates along the tracks. Total projective cover varied from 30–40% to 70–80%. The diagnostics species of association are *Amaranthus albus* L. and *Eragrostis minor*. The number of species in the coenosis varied from 10 to 27 (average number of species in the description – 17); floristic composition of the association were consisted of 40 species, including transformer species *Ambrosia artemisiifolia*, *Phalacroloma annuum* and invasive species *Conyza canadensis*, *Galinsoga parviflora*, *Xanthoxalis dillenii*.

The plant community of association *Ivaetum xanthifoliae* noted in the town area "Graviton" in Chernivtsi was occurred on sandy soils on wasteland near the roads. Total projective cover was 90%; the 13 species noted in the communities with dominated of *Iva xanthiifolia* Nutt. (70%) and diagnostic species of the association *Tripleurospermum inodorum* (L.) Sch.Bip. and *Urtica dioica* L. Invasive species *Echinochloa crusgalli*, *Conyza canadensis* and *Galinsoga parviflora* were noted in the community.

The plant community of association *Artemisietum annuae* noted in Chernivtsi (Kaspiyska street) was concentrated on sandy substrates in the valley of River Klokuchka. The total projective cover was 90%. In floristic composition of communities 24 species were recorded; they were dominated by *Artemisia annua* L., and codominated *Chenopodium album* L. and *Geranium sibiricum* L., rare presented *Setaria glauca*, *Lactuca serriola* L., *Amaranthus powellii* S.Watson, *Xanthium albinum* (projective cover were 1–5 % of each of the species). The components of the community were transformer species *Phalacroloma annuum*, *Solidago canadensis* L. and some invasive species *Conyza canadensis*, *Geranium sibiricum.*

The plant community of association *Conyzo canadensis-Lactucetum serriolae* was distributed along road in town area "Graviton" in Chernivtsi and Chernivtsi-Pivdenna railway stations, and also were concentrated on the margins communities along the roads and tracks in the Storozhynets and Beregomet. Total projective cover of communities varied from 60% to 95%. Predominant diagnostic species of association are *Conyza canadensis* (40%), *Lactuca serriola* (40%). Species *Tripleurospermum inodorum* and *Cirsium arvense* (L.) Scop. are noted by 1–2% respectively The average number of species in the community were 26, in floristic composition of associations – 68 species, including 3 transformer species *Solidago canadensis* (occurring as isolated individuals), *Phalacroloma annuum* (the projective cover which ranges from 1–2% to 5–7%) and *Ambrosia artemisiifolia* (5–7%). Other invasive species *Echinochloa crusgalli*, *Galinsoga urticifolia, Geranium sibiricum*, *Impatiens parviflora*, *Xanthoxalis dillenii* and juvenile individuals of the plant of *Acer negundo* are noted.

The plant community of association *Setario pumilae-Echinochloetum cruris-galli* was concentrated on sandy soils in disturbed areas of by pass roads of town area "Graviton" and "Sadky" (Chernivtsi), "Glyboka-Bukovynska" and "Vadul-

Syret" railway stations and in the Storozhynets. Total projective cover of plant community varied from 20–25% to 90–100%. The diagnostic species of the association are *Echinochloa crusgalli*, *Galinsoga parviflora*, *Amaranthus retroflexus* L., *Setaria pumila* (Poir.) Roem. & Schult., and *S. viridis* (L.) P. Beauv. In the association was founded 49 species, among them were transformer species *Ambrosia artemisiifolia* (1–2%), *Solidago canadensis*, *Phalacroloma annuum* (1–2%) and other invasive species *Capsella bursa-pastoris*, *Echinocystis lobata*, *Galinsoga urticifolia*, *Geranium sibiricum*, *Xanthoxalis dillenii*.

The plant community of class *Artemisietea vulgaris* is a ruderal community of high species of biennial or perennial plants that was noted on the edge, on waste lands, cemeteries, and marginal localities in the plains territory of Ukraine. The community of the class in the region includes 4 associations with the participation of invasive species.

The plant communities of association *Tanaceto vulgaris-Artemisietum vulgaris* were found in Chernivtsi (Pivdenno-kiltseva street) on wasteland, along dirt roads on railway stations and in Beregomet and Storozhynets. Total projective cover was 60–80%. It was noted 25–38 species in the communities. The diagnostic species of the association are *Artemisia vulgaris* L., *Tanacetum vulgare* L., *Daucus carota* L., *Cichorium intybus*, *Lactuca serriola*. The components of communities were transformer species *Phalacroloma annuum*, *Solidago canadensis* and invasive species *Capsella bursa-pastoris*, *Cichorium intybus*, *Conyza canadensis*, *Echinocystis lobata*, *Helianthus tuberosus* L. and *Lamium album*. The *Solidago canadensis* in some communities of the association can be dominated, and number of native species that accompany it in the communities was less than a projective covering of *S. canadensis* was 15–20%.

The plant community of association *Melilotetum albo-officinalis* were found along trails between Storozhynets and Chernivysi-Pivdenna (Chernivtsi) railway stations. Total projective cover varied from 70–80% to 90%. The communities of the association included from 23 to 28 species. The components of communities were transformers *Ambrosia artemisiifolia* and *Phalacroloma annuum* and invasive species *Conyza canadensis*, *Cichorium intybus*, *Geranium sibiricum* and *Xanthoxalis dillenii.*

The plant community of association *Berteroetum incanae* Sissingh et Tideman ex Sissingh 1950 were concentrated on rabble plots along railways in Storozhynets. Floristic composition was scanty, number of species in communities varied from 13 to 22. Total projective cover was 60–70 %. *Berteroa incana* (L.) DC. is a diagnostic species. The transformer *Ambrosia artemisiifolia*, invasive species *Conyza canadensis*, *Cichorium intybus* and juvenile individuals of the plant of *Acer negundo* were noted in this community.

The plant communities of association *Convolvulo-Agropyretum repentis* were found in the city area "Graviton" (Chernivtsi) and concentrated on margins habitats bypass road. Total projective cover was 100%. Number of species in communities varied from 19 to 43. The diagnostic species of this association are *Elytrigia repens* (L.) Nevski and *Cirsium arvensis* L., and well presented by

species of classes *Molinio-Arrhenatheretea*, and *Polygono arenastri-Poetea annua*. Components of communities of the association were *Phalacroloma annuum* (5–7%), *Solidago canadensis* (projective cover varied from 1–2% to 20–25%) and *Ambrosia artemisiifolia* (5–7%).

The plant communities of class *Galio-Urticetea* were natural and artificial high of herbaceous meso–- and nitrofilic communities, which were formed in moist, shaded soils, lawns, river banks, parks, gardens, cemeteries, etc. The communities of the class with invasive species in the region were classified to 8 associations.

The plant community of association *Chaerophylleto hirsuti-Cirsietum oleracei* was distributed in the city area "Sadky" (Chernivtsi) and vicinity of Terebleche village (Hlyboka District). General projective cover was 100%. Diagnostic species of the association are *Cirsium oleraceum* (L.) Scop., *Rumex confertus* Willd., and *Chaerophyllum hirsutum* L. In the composition of communities of the association 28 species were founded, including transformer species *Impatiens parviflora*, *Phalacroloma annuum*, *Rudbeckia laciniata*, *Solidago canadensis*.

The plant community of association *Chaerophylletum aromatici* was distributed in Chernivtsi near forest along the railways (Zalozetskoho street) and in the city area "Sadky". Total projective cover was 90–100%. The number of species in communities was 20-24. The diagnostic species of association is *Chaerophyllum aromaticum* L. In the communities of the association were founded transformer species *Solidago canadensis* (projective cover from 3–5% to 30–40%), *Acer negundo* (j), *Ambrosia artemisiifolia*, *Impatiens parviflora*, and invasive species *Helianthus tuberosus*, *Geranium sibiricum.*

The plant community of association *Reynoutrietum japonicae* was noted in Chernivtsi along the highway, in Zelena street, and on the bank habitats of Molnytsya River (near the railway). Total projective cover of communities was 100%; dominated by *Reynoutria japonica*, the projective cover of the species varies from 50–60% to 90%. Number of species in communities varied from 13 to 29, including transformer species *Acer negundo*, *Impatiens parviflora*, *Phalacroloma annuum*, *Solidago canadensis*, and invasive species *Echinocystis lobata*, *Geranium sibiricum*, *Impatiens glandulifera*. The plant community of the association *Urtico dioicae-Heracleetum mantegazzianii* was found near Budenets village of Storozhinetskiy district in abandoned farm place. Total projective cover of communities was 90–95%. In the community of association dominate *Heracleum mantegazzianum*, the projective cover of the species is 70–80%. In the communities 16 species were noted and its floristic composition was poor. Similar monodominant community of association *Urtico dioicae-Heracleetum mantegazzianii* in Bucovinian Cis-Carpathians was formed in ruderalized habitats along roads and dirt roads. The components of the community were transformer species *Phalacroloma annuum* and *Solidago canadensis* and invasive species *Conyza canadensis*.

Association *Sambucetum ebulii* found in the Landscape Conservation area Tsetsyno (Revnyanske Forestry, Apt. 25) was concentrated on the edges and along the dirt roads of tracks in Chernivtsi and Glyboka Bukovynska railways

station. The total projective coverage was100%. The *Sambucus ebulus* L. was dominated and *Glechoma hederacea* L., *Ranunculus repens* L. were codominated. In the floristic composition 52 species were identified, the number of species in the communities was 11–28, including transformer species *Phalacroloma annuum*, *Acer negundo*, and invasive species *Conyza canadensis*, *Iva xanthiifolia*, *Galinsoga parviflora*, *Geranium sibiricum*.

The plant community of association *Stachyo sylvaticae-Impatientetum noli-tangere* was distributed at the territory of the Landscape Conservation area Tsetsyno (Revnyanske Forestry, Apt. 25), and concentrated in wet habitats along the forest road. Total projective cover of community was 100%; in the community noted 18 species. The diagnostic species of the association, *Impatiens noli-tangere* L. (70–80%), dominated, and *Urtica dioica* (5–7%), *Circaea lutetiana* L., *Lamium maculatum* (L.) L., *Chrysosplenium alternifolium* L. were other common species; transformer species *Impatiens parviflora* and invasive species *Lamium album* also noted.

The plant community of association *Calystegio sepium-Impatientetum glanduliferae* was distributed in Chernivtsi (Kalynivskyi and Moscow street along forest belt, and Kovelska street) as well as in the city area “Sadky”. Total projective cover of vegetation was 90–100%. The number of species in the community varied within 16–30; in the floristic composition of community noted 76 species, including transformer species *Acer negundo*, *Impatiens parviflora*, *Solidago canadensis*, *Phalacroloma annuum*, and invasive species *Conyza canadensis*, *Echinocystis lobata* and *Geranium sibiricum*.

The plant community of association *Rudbeckio laciniatae-Solidaginetum canadensis* was dominated by *Solidago canadensis* (projective cover of the species 40–80%), distributed in Chernivtsi nearby dirt road leading to the Kherson street, along railroad from its crossing with the Vinnichenko street to Chernivtsi-Pivdenna railways station, on the edge of the oak forest tract “Buhayets” (valley Molnytsya River, between inter Stanivtsi and Petrashivka villages of Glyboka district). In the plant communities of this subassociation the number of species varied from 15 to 38, including transformer species were *Acer negundo*, *Ambrosia artemisiifolia*, *Impatiens parviflora*, *Phalacroloma annuum*, and invasive species *Bunias orientalis*, *Cichorium intybus*, *Galinsoga parviflora*, *Lamium album*, *Xanthoxalis dillenii*.

The plant community of association *Rudbeckio laciniatae-Solidaginetum canadensis,* with the prevalence of *Rudbeckia laciniata* (projective coverage of the species 5–90%) was concentrated in the high plant of ruderal mesophilic habitats of Zhadova River near Old Zhadova village (Storozhynets District), on the left bank of the Siret River in Storozhynets. As an edging community it noted along the railway and roads distribute in vicinity of the Nova Zhadova village and in abandoned meadows near the Botanical Conservation area “Bilka” near Panka village (Storozhinets District). Total projective cover was 100%. The number of species varied from 5 to 36, including invasive species *Galinsoga urticifolia* and *Phalacroloma annuum*. Thus, with increasing of projective cover of *R. laciniata* was decreased in the association participation of *Aegopodium*

podagraria L. (1-20%), *Urtica dioica* (1-40%), *Cirsium arvense* (1-50%), *Rubus caesius* L. (2-50%), *Calystegia sepium* (L.) R.Br. (5-10%), and projective cover of species of *Poaceae*: *Elytrigia repens*, *Dactylis glomerata* L., *Arrhenatherum elatius* (L.) J. Presl & C. Presl, *Calamagrostis epigeios* (L.) Roth, *Agrostis capillaris* L. and meadow species: *Achillea submillefolium* Klokov & Krytzka, *Centaurea jacea* L., *Lathyrus pratensis* L., *Vicia cracca* L.

The general trend of changes nitrofilous-ruderal hydrophilic type plant community was a redistribution in their composition the dominant species and formation a monodominant communities with prevalence of invasive species. The results are a substitute of natural habitats of its synanthropic option. Case studies are incorporation, naturalization and active distribution of *Rudbeckia laciniata* in nitrophilous natural river banks habitats of Bukovinian Cis-Carpathians. Thus, *Rubus caesius* was dominated in natural habitats of the fragment of nitrophilous-ruderal hydrophilic plant cover on the Siret River bank (Storozhynets) (total number of species in the community consists 35). In disturbed habitats *Rudbeckia laciniata* was dominated and observed inhibition process of its native species, leading to depletion of the species composition of this community (number of species is 12) and changed the structure of a typical plant communities.

Artificial tree planting, deforestationt communities and urban spontaneous woody plant vegetation belongs to the class *Robinietea*. The plant community of association *Impatienti parviflorae-Robinietum* was forming under the strong influence of human activity on the territory of Shiller and Zhovtnevy park-monument of Landscape Architecture area, and in the forest belt in Chernivtsi (Zelena street). *Robinia pseudoacacia* and sometimes with *Acer platanoides* L. was dominated in the tree layers (density canopy 0,9). Shrubby layer was formed by *Sambucus nigra* L. and undergrowth of the forest species. In dense herbaceous plant cover (total projective cover 80–90%) the diagnostic species of associations *Impatiens parviflora* (60–70%) dominated; and also noted the following transformer species *Solidago canadensis*, *Phalacroloma annuum* and individuals of invasive plants *Acer negundo*, *Echinocystis lobata*, *Geranium sibiricum*, *Reynoutria japonica*.

Poliploid ability to adapt to extremal conditions was established (GRANT 1981; STEBBINS 1984; PERSHINA 2009, etc.). G.L. Stebbins (STEBBINS 1984) noted that climate is less depended on the spread of poliploid than on the catastrophic changes in the environment, and appearance of habitats with new ecological conditions. Among of the invasive species of the region predominate polyploidy. That is the one of the characteristics of invasive species that probably helps them to successfully adapt to extreme conditions of the invaded area and to grow in various types of anthropogenic transformed ecotopes.

Conclusion

Analysis of material floristic and geobotanical studies of plant communities and floristic complexes of Bukovinian Cis-Carpathian gives a reason to believe in an enlargement in the investigated area communities of synanthropic vegetation

classes and spontaneous woody vegetation that includes increasing number of invasive species. Thus, the most of invasibility are synanthropic plant communities *Artemisietea vulgaris*, *Galio-Urticetea*, and transformed community of classes *Querco-Fagetea* and *Robinietea* in natural flora of the region.

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