

Syntaxonomy of plant communities with diagnostic species of genus *Elytrigia*

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Syntaxa diagnosed by species of *Elytrigia* Desv. (*Elytrigia repens* (L.) Nevski, *E. elongata* (Host) Nevski, *E. intermedia* (Host) Nevski, *E. nodosa* (Nevski) Nevski, *E. pseudocaesia* (Pach.) Prokud., *E. trichophora* (Link) Nevski, *E. strigosa* (M.Bieb.) Nevski, *E. scythica* (Nevski) Nevski, *E. bessarabica* (Sävul. & Rayss) Prokud. are inventoried based on analysis of literature. Syntaxonomical content of the communities includes 48 associations from 25 alliances, 17 orders and 13 classes. A lot of the syntaxa are common and widespread (*Elytrigio repentis-Aegopodietum podagrariae* Tüxen 1967, *Urtico dioicae-Tanacetum vulgare* Kostylev in V. Solomakha et al. 1992, *Artemisietum vulgare* R. Tüxen 1942, *Elytrigio repentis-Robiniatum pseudoacaciae* Smetana, Derpoluk, Krasova 1997, etc.) or occur sporadically (*Acini arvensis-Elytrigietum intermediae* (Kukovitsa et al. 1994) Kukovitsa in V. Solomakha 1995, *Salvio nemorosae-Elytrigietum intermediae* Tyschenko, 1996, *Goniolimoni taurici-Poetum angustifoliae* Tyschenko 1996, *Limonio-Festucetum pseudodalmaticae* V. Solomakha et Shelyag-Sosonko 1984 etc.) in Ukraine. An absolute majority of the studied coenoses are in a state of dynamic expansion, with the exception of some relatively rare communities (*Elytrigio trichophorae-Poetum angustifoliae* (Kostylev et al. 1984) V. Solomakha 1995, *Adonidi-Stipetum tirsae* Didukh 1983, *Drabo cuspidatae-Potentilletum geoidis* Ryff 2000, *Laserpitio hispido-Heracleetum stevenii* Korzhenevsky et Ryff 2002, etc.) that are constantly threatened by ecotope elimination. Most of the communities (23 associations) are dominated by *Elytrigia repens* that has wide ecological amplitude.

Key words: *Elytrigia*, species, syntaxonomy, Poaceae, flora of Ukraine

Олійник М.П., Губарь Л.М. (2019). **Синтаксономія рослинних угруповань з діагностичними видами роду *Elytrigia***. *Чорноморськ. бот. ж.*, **15** (1): 26–35. doi: 10.32999/ksu1990-553X/2019-15-1-3

Наведено результати інвентаризації синтаксонів, діагностичними видами яких є види роду *Elytrigia* Desv. (*Elytrigia repens* (L.) Nevski, *E. elongata* (Host) Nevski, *E. intermedia* (Host) Nevski, *E. nodosa* (Nevski) Nevski, *E. pseudocaesia* (Pach.) Prokud., *E. trichophora* (Link) Nevski, *E. strigosa* (M.Bieb.) Nevski, *E. scythica* (Nevski) Nevski), *E. bessarabica* (Sävul. & Rayss) Prokud. на підставі аналізу літературних джерел. Синтаксономічний склад досліджених рослинних угруповань нараховує 48 асоціацій, що належать до 25 союзів, 17 порядків та 13 класів. Значна частина синтаксонів рослинності належать до звичайних з частим (*Elytrigio repentis-Aegopodietum podagrariae* Tüxen 1967, *Urtico dioicae-Tanacetum vulgare* Kostylev in V. Solomakha et al. 1992, *Artemisietum vulgare* R. Tüxen 1942, *Elytrigio repentis-Robiniatum pseudoacaciae* Smetana, Derpoluk, Krasova 1997 та ін.) та спорадичним (*Acini arvensis-Elytrigietum intermediae* (Kukovitsa et al. 1994) Kukovitsa in V. Solomakha 1995, *Salvio nemorosae-Elytrigietum intermediae* Tyschenko, 1996, *Goniolimoni taurici-Poetum angustifoliae* Tyschenko 1996, *Limonio-Festucetum pseudodalmaticae* V. Solomakha et Shelyag-Sosonko 1984 та ін.) поширенням на території України. Більшість досліджених фітоценозів відзначається експансивним динамічним станом. Винятком є відносно рідкісні асоціації (*Elytrigio trichophorae-Poetum angustifoliae* (Kostylev et al. 1984) V. Solomakha 1995, *Adonidi-Stipetum tirsae* Didukh 1983, *Drabo cuspidatae-*



Potentilletum geoidis Ryff 2000, *Laserpitio hispidi-Heracleetum stevenii* Korzhenevsky et Ryff 2002 та ін.) що перебувають під потенційною загрозою зникнення внаслідок елімінації їхніх екотопів. Едифікатором більшості рослинних угруповань (23 асоціації) є вид широкої екологічної амплітуди *Elytrigia repens*.

Ключові слова: види роду *Elytrigia* Desv., синтаксономія, родина *Poaceae*, флора України

ОЛИЙНИК М.П., ГУБАРЬ Л.М. (2019). Синтаксономія растительных сообществ с диагностическими видами рода *Elytrigia*. *Черноморськ. бот. ж.*, **15** (1): 26–35. doi: 10.32999/ksu1990-553X/2019-15-1-3

Приведены результаты инвентаризации синтаксонов, диагностическими видами которых являются виды рода *Elytrigia* Desv. (*Elytrigia repens* (L.) Nevski, *E. elongata* (Host) Nevski, *E. intermedia* (Host) Nevski, *E. nodosa* (Nevski) Nevski, *E. pseudocaesia* (Pach.) Prokud., *E. trichophora* (Link) Nevski, *E. strigosa* (M.Bieb.) Nevski, *E. scythica* (Nevski) Nevski), *E. bessarabica* (Săvul. & Rayss) Prokud. на основании анализа литературных источников. Синтаксономический состав исследованных растительных сообществ насчитывает 48 ассоциаций, относящихся к 25 союзам, 17 порядкам и 13 классам. Значительная часть синтаксонов растительности принадлежат к обычным с частым (*Elytrigio repentis-Aegopodietum podagrariae* Tüxen 1967, *Urtico dioicae-Tanacetum vulgare* Kostylev in V. Solomakha et al. 1992, *Artemisietum vulgare* R. Tüxen 1942, *Elytrigio repentis-Robiniatum pseudoacaciae* Smetana, Derpoluk, Krasova 1997 и др.) и спорадическим (*Acini arvensis-Elytrigietum intermediae* (Kukovitsa et al. 1994) Kukovitsa in V. Solomakha 1995, *Salvio nemorosae-Elytrigietum intermediae* Tyschenko, 1996, *Goniolimoni taurici-Poetum angustifoliae* Tyschenko 1996, *Limonio-Festucetum pseudodalmaticae* V. Solomakha et Shelyag-Sosonko 1984 и др.) распространением на территории Украины. Большинство исследованных фитоценозов отмечается экспансивным динамическим состоянием. Исключением являются относительно редкие ассоциации (*Elytrigio trichophorae-Poetum angustifoliae* (Kostylev et al. 1984) V. Solomakha 1995, *Adonidi-Stipetum tirsae* Didukh 1983, *Drabo cuspidatae-Potentilletum geoidis* Ryff 2000, *Laserpitio hispidi-Heracleetum stevenii* Korzhenevsky et Ryff 2002 и др.) находящиеся под потенциальной угрозой исчезновения вследствие элиминации их экотопов. Эдификатором большинства растительных сообществ (23 ассоциации) является вид широкой экологической амплитуды *Elytrigia repens*.

Ключевые слова: виды рода *Elytrigia* Desv., синтаксономія, семейство *Poaceae*, флора Украины

Genus *Elytrigia* Desv. is one of the biggest genera in the tribus Triticeae Dum. (*Poaceae* Barnh.). It has important significance for resource science. The species of the genus are widely used in agriculture (*E. repens*, *E. elongata*, *E. intermedia*) as fodder herbs and erosion control (*E. repens*, *E. stipifolia* (Czern. ex Nevski) Nevski). *Elytrigia* herbs for medicine (*E. repens*). According to recent data, the genus includes about 50 species. The phylogenetical relationship between these taxa are a subject for discussion [TSVELEV, 1976; MELDERIS et al., 1980; GUBAR, 2013].

Species of genus *Elytrigia* Desv. from the point of view of general biology and genetics of the plants are a discussion model for research of the processes of morphological variability, phenotypic plasticity, speciation, hybridization, biosystematics, phylogeny and population biology. Most of the problems of couch grass systematics and taxonomy are due to the fact that inter-species hybridization often happens among species of this genus and it also applies to the studied species of the genus *Elytrigia* of Ukrainian flora [KOSTINA, AGAFONOV, 2002; DIZKIRICI et al., 2010; TZVELEV, PROBATOVA, 2010]. The species of genus *Elytrigia* represent a compound, interspecific complex. Relations of natural ecological and geographical races of it (species, subspecies, varieties, hybrids) remain largely unexplained and deserve to be profoundly studied on a biosystematic and molecular phylogenetic level.

Relationship between plants underpin the organization and dynamic of phytocenosis. In recent years, the study of these processes is especially relevant. First and foremost, this is

related to the growing needs of humankind in the development of conservation measures and sustainable use of vegetation (phytocenosis). An important object of such research is the species of the genus *Elytrigia*, which are widespread and are diagnostic for meadow, steppe, and ruderal groups. The signs and properties of plant populations-species of this genus, vary depending on the variability of environmental factors and spatial and temporal changes. Species populations differ in levels of succession and cenotic confinement. Thus, establishment of a range of cenosis in which these types play a dominant role is the first step on the way of the life strategy research of these species.

Materials and methods

Syntaxons identification and composition of vegetation prodromus were carried out on the basis of available literary sources on phytocenology, including contemporary classification schemes of vegetation in Ukraine [SOLOMAKHA et al., 1992; KOROTCHENKO, DIDUKH, 1997; BABKO, 1999; KOROTCHENKO, FITSAILO, 2003; KUCHERAVYI et al., 2003; SOROKA, 2004; KUZYARIN, 2005; SOLOMAKHA, 2005; OSYPENKO, 2006; SLIVINSKA, BALASHOV, 2006; CHYNKINA, 2006; CHOKHA, 2006; MELEGHIK et al., 2008; SOROKA, 2008; KORZHENEVSKY, KVITNYTSKA, 2009; PASHKEVYCH, FITSAILO, 2009; SKROBALA, 2009; GOLUB et al., 2011; KUZEMKO, 2011; PARPAN, NESPLIAK, 2011; DIDUKH, VASHENYAK, 2012; KAHALO, RESLER, 2012; PARPAN, OLIINYK, 2012; PASHKEVYCH, HAVRYLOV, 2012; PARPAN, OLIINYK, 2013A,B; DIDUKH, 2014; KOLOMIYCHUK, MELEZHYK, 2014; KONOHRAI, 2014; KRAMARETS, BREDIHINA, 2014; OLIINYK, 2014; BREDIHINA, 2015; VOROBOV et al., 2015; BAGRIKOVA, 2016; SHEVCHYK, KHOMIAK, 2016; OLIINYK, 2017]. The higher syntaxonomic units are given in accordance with the latest edition of “Vegetation of Europe...” [MUCINA et al., 2016], the lower syntaxonomic units are rendered in accordance with the above mentioned Ukrainian and foreign sources and according to the International Code of Phytosociological Nomenclature [WEBER et al., 2000]. The names of taxons are given in accordance with «Vascular plants of Ukraine. A nomenclatural checklist» [MOSYAKIN, FEDORONCHUK, 1999].

By diagnostic, we mean the species which are characterized by high consistency in associations and most accurately reflect their appearance, structure and ecological properties of habitat. Diagnosticity of species of the genus *Elytrigia* in syntaxons, which are referred to in this article, is accepted by the above-cited literary sources [ALEXANDROVA, 1969].

The research subject is the classification of vegetation with the participation of species of the genus *Elytrigia* Desv.

Results and discussions

According to different authors, nearly 50 species of the genus *Elytrigia* grow in subtropical and temperate climate areas [PROKUDYN et al., 1977; TSVELEV, PROBATOVA, 2010; GUBAR, 2013]. Twenty-four *Elytrigia* species were found in Europe including 16 specific to flora of Eastern Europe [MOSYAKIN, FEDORONCHUK, 1999].

Eight species of *Elytrigia* (*Elytrigia repens* (L.) Nevski, *E. elongata* (Host) Nevski, *E. intermedia* (Host) Nevski, *E. nodosa* (Nevski) Nevski, *E. pseudocaesia* (Pach.) Prokud., *E. trichophora* (Link) Nevski, *E. strigosa* (M.Bieb.) Nevski, *E. scythica* (Nevski) Nevski), *Elytrigia* (Sävul. & Rayss) Prokud. of the flora of Ukraine are apparently diagnostic for 48 associations from 25 alliances, 17 orders and 13 vegetation classes of the following syntaxonomy:

Cl. *Asplenetea trichomanis* (Braun-Blanquet in Meier et Braun-Blanquet 1934) Oberdorfer 1977

Ord. *Geranio robertiani-Asplenetalia trichomanis* Ferrez ex Mucina et al. 2016

All. *Drabo cuspidatae-Campanulion tauricae* Ryff 2000

Ass. *Drabo cuspidatae-Potentilletum geoidis* Ryff 2000 (D.s. *Elytrigia strigosa*)

Cl. *Drypidetea spinosae* Quezel 1964

- Ord. *Onosmo polyphyllae-Ptilostemonetalia* Korzhenevsky 1990
 All. *Austrodauco-Salvion verticillati* Korzhenevsky et Klyukin 1990
 Ass. *Lolio loliacei-Brassicetum tauricae* Ryff 1999 (D.s. *Elytrigia nodosa*)
 All. *Ptilostemonion echinocephali* Korzhenevsky 1990
 Ass. *Laserpitio hispidi-Heracleetum stevenii* Korzhenevsky et Ryff 2002
 (D.s. *Elytrigia scythica*)
 All. *Gypsophilo glomeratae-Cephalarion coriacea* Ryff in Golub et al. 2011
 Ass. *Elytrigio elongatae-Onobrychidetum pallasii* Ryff 2004 (D.s. *Elytrigia elongata*)
 Cl. *Crataego-Prunetea* Tüxen 1962
 Ord. *Paliuretalia* Trinajstić 1978
 All. *Elytrigio nodosae-Rhuion coriariae* Korzhenevsky et Ryff ex Didukh et Mucina 2014
 Ass. *Seseli dichotomi-Rhuetum coriariae* Didukh et Mucina 2014 (D.s. *Elytrigia nodosa*)
 Ass. *Melico tauricae-Rhuetum coriariae* Didukh et Mucina 2014 (D.s. *Elytrigia nodosa*)
 Cl. *Molinio-Arrhenatheretea* Tx. 1937
 Ord. *Molinietalia caeruleae* Koch 1926
 All. *Deschampsion cespitosae* Horvatić 1930
 Ass. *Agropyro-Alopecuretum pratensis* Moraveč 1965 (D.s. *Elytrigia repens*)
 Ord. *Potentillo-Polygonetalia avicularis* Tx. 1947
 All. *Potentillion anserinae* Tx. 1947
 Ass. *Glechomo hederaceae-Potentilletum reptantis* Levon 1997 (D.s. *Elytrigia repens*)
 Cl. *Festuco-Brometea* Braun-Blanquet et Tüxen ex Soó 1947
 Ord. *Festucetalia valesiaca* Soó 1947
 All. *Festucion valesiaca* Klika 1931
 Ass. *Acini arvensis-Elytrigietum intermediae* (Kukovitsa et al. 1994) Kukovitsa in V. Solomakha 1995 (D.s. *Elytrigia intermedia*)
 Ass. *Salvio nemorosae-Elytrigietum intermediae* Tyschenko 1996 (D.s. *Elytrigia intermedia*)
 All. *Achilleo setaceae - Poenion angustifoliae* Tkachenko & al. 1987
 Ass. *Medicagini romanicae-Poetum angustifoliae* Tkachenko, Movchan et V. Solomakha 1987 (D.s. *Elytrigia repens*)
 Ass. *Achilleo setaceae-Poetum angustifoliae* Marjushkina et V. Solomakha 1986 (D.s. *Elytrigia repens*)
 Ass. *Elytrigio trichophorae-Poetum angustifoliae* (Kostylev et al. 1984) V. Solomakha 1995 (D.s. *Elytrigia trichophora*)
 Ass. *Goniolimoni taurici-Poetum angustifoliae* Tyschenko 1996 (D.s. *Elytrigia elongata*)
 All. *Artemisio tauricae-Festucion* Korzhenevsky et Klyukin 1991
 Ass. *Arenario uralensis-Elytrigietum pseudocaesia* Solomakha et al. 2005 (D.s. *Elytrigia pseudocaesia*)
 All. *Adonido vernalis-Stipion tirsae* Didukh in Didukh et Mucina 2014
 Ass. *Adonido vernalis-Stipetum tirsae* Didukh in Didukh et Mucina 2014 (D.s. *Elytrigia trichophora*)
 All. *Artemisio marschalliana-Elytrigion intermediae* Korotchenko et Didukh 1997
 Ass. *Astragalo dasyanthi-Elytrigietum intermediae* Korotchenko et Didukh 1997 (D.s. *Elytrigia intermedia*)
 Cl. *Pegano harmalae-Salsoletea vermiculatae* Braun-Blanquet et O. de Bolòs 1958

- Ord. *Helichryso stoechadis-Santolinietalia squarrosae* Peinado et Martínez-Parras 1984
All. *Atraphaco-Capparidion* Korzhenevsky 1988
Ass. *Atraphaco-Capparidetum* Korzhenevsky et Klyukin 1988 (D.s. *Elytrigia elongata*)
- Cl. *Festuco-Puccinellietea* Soó ex Vicherek 1973
Ord. *Artemisio santonicae-Limonietalia gmelinii* Golub et V. Solomakha 1988
All. *Plantagini salsae-Artemision santonicae* Shelyag-Sosonko et Solomakha in Lysenko, Mucina et Iakushenko 2011
Ass. *Limonio alutaceae-Elytrigietum elongatae* Bairak 1997 (D.s. *Elytrigia elongata*)
Ass. *Artemisio santonicae-Elytrigietum elongatae* Dubyna, Neuhäuslova, Shelyag-Sosonko 1995 (D.s. *Elytrigia elongata*)
Ass. *Agropyro elongati-Inuletum salicinae* Serbanescu 1965 (D.s. *Elytrigia elongata*)
Ass. *Agropyretum elongatae* Serbanescu 1965 (D.s. *Elytrigia elongata*)
Ass. *Limonio meyeri-Elytrigietum elongatae* Tyshchenko 1996 (D.s. *Elytrigia elongata*)
- Ord. *Festuco valesiaca-Limonietalia gmelinii* Mirkin in Golub et Solomakha 1988
All. *Limonio-Festucion* V. Solomakha et Shelyag-Sosonko 1984
Ass. *Limonio-Festucetum pseudodalmatica* V. Solomakha et Shelyag-Sosonko 1984 (D.s. *Elytrigia elongata*)
All. *Diantho-Milion vernale* Umanets et I. Solomakha 1988
Ass. *Cardario-Stipetum capillatae* Umanets et V. Solomakha 1988 (D.s. *Elytrigia pseudocaesia*)
All. *Camphorosmo-Agropyron desertorum* Korzhenevsky et Klyukin in Golub et al. 2005
Ass. *Meliloti-Elytrigietum repensii* Korzhenevsky et Klyukin 1990 (D.s. *Elytrigia repens*)
- Cl. *Juncetea maritimi* Braun-Blanquet in Braun-Blanquet et al. 1952
Ord. *Juncetalia maritimi* Braun-Blanquet ex Horvatić 1934
All. *Juncion maritimi* Braun-Blanquet ex Horvatić 1934
Ass. *Plantagini salsa-Juncetum maritimi* Shelyag-Sosonko et V. Solomakha 1987 (D.s. *Elytrigia bessarabica*)
Ass. *Plantagini-Limonietum* Westh. Et Segal 1961 (D.s. *Elytrigia elongata*)
- Cl. *Crypsietea aculeatae* Vicherek 1973
Ord. *Crypsietalia aculeatae* Vicherek 1973
All. *Lepidion latifolii* Golub et Mirkin in Golub 1995
Ass. *Cynancho acuti-Lepidietum latifolii* Dubyna, Neuhäuslová et Shelyag-Sosonko 1994 (D.s. *Elytrigia elongata*)
- Cl. *Robinietae* Jurko ex Hada c et Sofron 1980
Ord. *Chelidonio-Robinietae pseudoacaciae* Jurko ex Hadac et Sofron 1980
All. *Chelidonio majoris-Robinion pseudoacaciae* Hadac et Sofron ex Vitkova in Chytrý 2013
Ass. *Elytrigio repentis-Robinietum pseudoacaciae* Smetana, Derpoluk, Krasova 1997 (D.s. *Elytrigia repens*)
- Cl. *Sisymbrietea* Gutte et Hilbig 1975
Ord. *Sisymbrietalia sophiae* J. Tüxen ex Görs 1966
All. *Sisymbriion officinalis* Tüxen et al. ex von Rochow 1951
Ass. *Matricarietum perforatae* Keczynska 1975 (D.s. *Elytrigia repens*)
Ass. *Diplotaxio muralis-Erodietum cicutarii* Bagrikova 2002 (D.s. *Elytrigia repens*)
- Cl. *Artemisietea vulgaris* Lohmeyer et al. in Tüxen ex von Rochow 1951
Ord. *Agropyretalia intermedio-repentis* T. Müller et Görs 1969
All. *Convolvulo arvensis-Agropyron repentis* Görs 1967

- Ass. *Convolvulo-Agropyretum repentis* Felföldy (1942) 1943 (D.s. *Elytrigia repens*)
 Ass. *Agropyretum repentis* Görs 1966 (D.s. *Elytrigia repens*)
 Ass. *Cardario-Agropyretum* Th. Müller et. Görs 1969 (D.s. *Elytrigia repens*)
 Ass. *Elytrigio nodosae-Xeranthemetum cylindracei* Levon 1997 (D.s. *Elytrigia nodosa*)
 Ass. *Elytrigio repentis-Lycietum barbati* Kostylev in V. Solomakha et al. 1992 (D.s. *Elytrigia repens*)
 Ass. *Convolvulo-Brometum inermis* Elias 1979 (D.s. *Elytrigia repens*)
 Ord. *Onopordetalia acanthii* Braun-Blanquet et Tüxen ex Klika et Hadac 1944
 All. *Onopordion acanthii* Braun-Blanquet et al. 1936
 Ass. *Carduo acanthoidis-Onopordetum acanthii* Soó ex Jarolímek et al. 1997 (D.s. *Elytrigia repens*)
 Cl. *Epilobietea angustifolii* Tüxen et Preising ex von Rochow 1951
 Ord. *Arctio lappae-Artemisietalia vulgaris* Dengler 2002
 All. *Arction lappae* Tüxen 1937
 Ass. *Arctietum lappae* Felföldy 1942 (D.s. *Elytrigia repens*)
 Ass. *Arctio-Artemisietum vulgaris* Oberdorfer ex Th. Müller 1972 (D.s. *Elytrigia repens*)
 Ass. *Artemisietum vulgaris* R. Tüxen 1942 (D.s. *Elytrigia repens*)
 Ass. *Urtico dioicae-Tanacetum vulgaris* Kostylev in V. Solomakha et al. 1992 (D.s. *Elytrigia repens*)
 Ass. *Aristolochio-Agropyretum repentis* Bagrikova 2002 (D.s. *Elytrigia repens*)
 Ass. *Elytrigio repentis-Poetum compressae* Smetana, Derpoluk, Krasova 1997 (D.s. *Elytrigia repens*)
 Ass. *Balloto nigrae-Leonuretum cardiacaе* Tüxen et von Rochow 1942 (D.s. *Elytrigia repens*)
 Ass. *Chenopodio-Ballotetum nigrae* Tüxen 1931 (D.s. *Elytrigia repens*)
 Ord. *Circaeo lutetianae-Stachyetalia sylvaticae* Passarge 1967
 All. *Aegopodion podagrariae* Tüxen 1967
 Ass. *Elytrigio repentis-Aegopodietum podagrariae* Tüxen 1967 (D.s. *Elytrigia repens*)

Elytrigia repens is a species of wide ecological amplitude: it is a heliophyte that grows in hygrophytic, mesophytic, halomesophytic and xerophytic ecotopes [PROKUDYN et al., 1977]. It is a part of 23 associations belonging to 10 alliances, 10 orders and 6 classes. It is an environmental edaphicator of meadow steppe coenoses (*Festuco-Brometea*), mesophytic communities on salinized substrates of fluctuating humidity (*Festuco-Puccinellietea*), anthropogenically transformed arboreal coenoses (*Robinietaea*, *Epilobietea angustifolii*) and synanthropic communities (*Artemisietea vulgaris*, *Sisymbrietea*).

Elytrigia elongata is a mesoxerophyte and a heliophyte [PROKUDYN et al., 1977]. The species is found in 11 associations from 7 alliances, 7 orders and 6 classes. It is an environmental engineer of halophytic communities on salt marshes, on the sands of lower Dnieper, banks and islands and in general on the littoral of Ukrainian mainland (*Festuco-Puccinellietea*, *Crypsietea aculeatae*); xerophytic shrubberies on gleysols (*Drypidetea spinosae*); meadow steppe coenoses (*Festuco-Brometea*) and communities of Mediterranean mountain steppe, e.g. the Crimean mountains (*Pegano harmalae-Salsoletea vermiculatae*).

Elytrigia intermedia is a xeromesophyte and heliophyte [PROKUDYN et al., 1977]. It participates in 3 associations from 2 alliances, 2 orders and 1 classes. It grows in meadow steppe coenoses (*Festuco-Brometea*), in xerophilic shrubberies on gleysols (*Drypidetea spinosae*) occurring in steppes, including sandy areas, on steppe slopes, on chalks, limestone and loess outcrops, on sandstone, forest glades and edges, in thickets, on jajlas (plateaus), on

the edges of shelter belts and on roadsides. It grows copiously on rocky substrates of petrophilous steppe and makes dense stands in areas with disturbed vegetation.

Elytrigia nodosa is a xerophyte and a heliophyte [PROKUDYN et al., 1977]. It is the engineer of 4 associations from 3 alliances, 3 orders and 3 classes. A typical species for open dry slopes of gravelly screes, seashore clayey banks of the lower belt of the Southern Crimea (*Crataego-Prunetea*). On grassless slopes it sometimes grows in solid monostand shrub-like communities or thin communities with large tussocks. It also forms xerophytic shrubberies on gleysols (*Drypidetea spinosae*) and sinanthropic communities (*Artemisietea vulgaris*).

Elytrigia pseudocaesia is a xeromesophyte and a heliophyte [PROKUDYN et al., 1977]. It is found in 2 associations from 2 alliances, 2 orders and 2 classes, is a common dominant species of forbs-and-grasses meadows in brakish and briny oval depressions (*Festuco-Puccinellietea*) and in steppe zone grasslands (*Festuco-Brometea*).

Elytrigia trichophora is a xeromesophyte and a heliophyte [PROKUDYN et al., 1977] edificator of 2 associations belonging to 2 alliances, 1 order and 1 class. It tends towards washed-out chernozems, kastanozems, rocky substrates (gravelly soils, rocks, embankments). It makes up communities of forest edges, dry, steppe-ish glades and slopes (*Festuco-Brometea*).

Elytrigia strigosa is a xerophyte and a heliophyte [PROKUDYN et al., 1977]. It participates in 1 association (and so 1 alliance, 1 order and 1 class) and does not tolerate developed greensward. It is a common species of thinned herbaceous layer at open dry rocky slopes, rocks, embankments and weakly developed gravelly soils on jajlas and in the upper woody belt (in pine and beech forests) of the Crimean Mountains (*Asplenieta trichomanis*).

Elytrigia scythica is a xerophyte and a heliophyte [PROKUDYN et al., 1977], occurring in a single association. It is a diagnostic species of xerophilic shrubberies on gleysols (*Drypidetea spinosae*).

Elytrigia bessarabica is a psamophyte and a heliophyte [PROKUDYN et al., 1977], occurring in a single association. It grows in seaside sands and sand and shell rock floats of the Black and Azov sea littoral fringe. It is a diagnostic species of a group of the sea damp meadows on the moderately and severely saline soils of the northern Black Sea coast.

Conclusions

All in all, our inventory of syntaxa diagnosed by species of *Elytrigia* (*Elytrigia repens*, *E. elongata*, *E. intermedia*, *E. nodosa*, *E. pseudocaesia*, *E. trichophora*, *E. strigosa*, *E. scythica*, *E. bessarabica* literature data revealed that the vegetation of studied communities belongs to 48 associations from 25 alliances, 17 orders and 13 classes. Nine associations occur only in Ukraine (*Drabo cuspidatae-Potentilletum geoidis*, *Lolio loliacei-Brassicetum tauricae*, *Laserpitio hispidi-Heracleetum stevenii*, *Elytrigio elongatae-Onobrychidetum pallasii*, *Seseli dichotomi-Rhuetum coriariae*, *Melico tauricae-Rhuetum coriariae*, *Arenario uralensis-Elytrigietum pseudocaesia*, *Adonidi-Stipetum tirsae*, *Cardario-Stipetum capillatae*). Other associations have wider geographic ranges.

Elytrigia repens is a diagnostic species in most communities (23 associations) and has a wide ecological amplitude. Other species take part in 1 to 11 associations.

A lot of the syntaxa are common and widespread (*Elytrigio repentis-Aegopodietum podagrariae*, *Urtico dioicae-Tanacetum vulgare*, *Artemisietum vulgare*, *Elytrigio repentis-Robinetum pseudoacaciae* etc.) or occur sporadically (*Acini arvensis-Elytrigietum intermediae*, *Salvio nemorosae-Elytrigietum intermediae*, *Goniolimoni taurici-Poetum angustifoliae*, *Limonio-Festucetum pseudodalmatica* etc.) in Ukraine. An absolute majority of the studied coenoses are in a state of dynamic expansion, with the exception of some relatively rare communities (*Elytrigio trichophorae-Poetum angustifoliae*, *Adonidi-Stipetum tirsae*, *Drabo cuspidatae-Potentilletum geoidis*, *Laserpitio hispidi-Heracleetum stevenii* etc.) that are constantly threatened by ecotope elimination.

We consider the syntaxonomy of various species of *Elytrigia* to be insufficiently studied due to problematic structure of the genus, difficulties in species identification and absence of species-specific data on ecological strategies; we plan to address these questions in further research.

References

- ALEXANDROVA V.D. (1969). *Klassifikatsiya rastitelnosti. Obzor printsipov klassifikatsii i klassifikatsionnyih sistem v raznyih geobotanicheskikh shkolah*. L.: Nauka: 276 p.
- BAGRIKOVA N.A. (2016). Study of synanthropic vegetation of the Crimean peninsula according to ecological-floristic approach: state of matter, communities classification and perspective of the researches. *Works of Nikit. Botan. Gard*, **143**: 25–58. (in Ukrainian)
- BREDIHINA J.L. (2015). *Spontaneous vegetation in Melitopol town: syntaxonomy, phytomeliorative significance and directions of optimization*. Lviv: National Forestry University of Ukraine (in Ukrainian).
- BABKO I.A. (1999). *Steppe plant cover differentiation of the Left-Bank Forest-Steppe south part of Ukraine*. Kyev: M.G. Kholodny Institute of Botany of the National Academy of Sciences of Ukraine (in Ukrainian).
- CHOKHA O.V. (2006). Ecological peculiarities of Kyiv Turf-Grasses vegetation. *Ukr. Phytosociol. Collect.*, **24**: 53–61. (in Ukrainian)
- CHINKINA T. (2006). Wetland vegetation syntaxonomic diagram of the river Dnieper river estuary region. *Visnyk of L'viv Univ., Biology series*, **42**: 32–37. (in Ukrainian)
- DIDUKH YA.P. (2014). Synergetic approaches to the assessment of landscape and ecological differentiation of Karabi Plateau (Mountain Crimea). *Ukr. Geograph. J.*, **1**: 36–43. (in Ukrainian)
- DIDUKH Y.P., MUCINA L. (2014). Validation of the name of some syntaxa of Crimean vegetation. *Lazaroa*, **35**: 181–190.
- DIDUKH YA.P., VASHENYAK YU.A. (2012). Steppe vegetation in Central Podillya. *Ukr. Bot. J.*, **69**(6): 789–817. (in Ukrainian)
- DUBYNA D.V., DZIUBA T.P., NEUHÄUSLOVA Z. (2007). Halophytic vegetation. Classes *Bolboschoenetea maritime*, *Festuco-Puccinellietea*, *Molinio-Juncetea*, *Crypsietea aculeatae*, *Thero-Salicornietea strictae*, *Salicornietea fruticosae*, *Juncetea maritime*. Edit.-in-chief Yu.R. Shelyag-Sosonko. Vegetation of Ukraine. K.: Phytosociocentre: 315 p. (in Ukrainian)
- DIZKIRICI A., KAYA Z., CABI E., DOGAN M. (2010). Phylogenetic relationships of *Elymus* L. and related genera (*Poaceae: Triticeae* Dumort.) based on the nuclear ribosomal internal transcribed spacer sequences. *Turk. J. of Botany*, **3**(6): 467–478.
- GOLUB V.B., GRECHUSHKINA N.A., SOROKIN A.N., NIKOLAYCHUK L.F. (2011). Plant communities of the class Onosmato polyphyllae-Ptilostemonetea Korzhenevsky 1990 on the territory of the Black Sea coast of the Caucasus and the Crimean peninsula. *Vegetation of Russia*, **17–18**: 3–16. (in Russian)
- GUBAR L.M. (2013). Rody *Agropyron* Gaertn., *Elymus* L., *Elytrigia* DESV., *Leymus* Hochst i *Psathyrostachys Nevski* (*Roaceae*) flory Ukrainy. II *Vseukrainska nauково-praktychna konferentsiia "Suchasni problemy pryrodnychkh nauk ta metodyky vykladannia" (do 80 richnytsi vid dnia stvorennia pryrodnycho-heohrafichnoho fakultetu): Materialy dopovidei / za zahalnoiui redaktsiieiu I.V. Marysovoi*. Nizhyn: NDU imeni Mykoly Hoholia: 21–22 (in Ukrainian).
- KAHALO O.O., RESLER I.YA. (2012). Vegetation of regional landscape park "Ravs'ke Roztochia" (Lviv region) – previous syntaxonomical assessment. *Scientific principles of biodiversity conservation*, **3**(10): 59–76. (in Ukrainian)
- KOLOMIYCHUK V.P., MELEZHYK O.V. (2014). Vegetation syntaxonomy of the sea of Azov landslide coasts. *Visnyk of Zaporizhzhya National University. Biological Sciences*, **1**: 173–182 (in Ukrainian).
- KONOHRAI V. (2014). Syntaksonomiia ta osoblyvosti terytorialnoho rozpodilu roslynnosti terytorii Kremenchutskoho vodoskhovyshcha. *Visnyk Lviv. un-tu. Serii biologichna*, **67**: 156–172. (in Ukrainian)
- KOROTCHENKO I.A., DIDUKH Y.P. (1997). The steppe vegetation of the southern part of the Left-Bank Forest-Steppe of the Ukraine. II. Class *Festuco-Brometea*. *Ukr. Phytosociol. Collect.*, **1**(6): 20–39. (in Ukrainian)
- KOROTCHENKO I., FITSAILO T. (2003). The steppe vegetation of Kyiv platean region. *Nauk. zap. NaUKMA. Biol. ta ekol.*, **21**: 20–36. (in Ukrainian)
- KORZHENEVSKY V.V., KVITNYTSKA A.A. (2009). Phytoindication of mud volcanos of the Crimea. *Pryrodnychy almanakh (biologichni nauky)*, **12**: 155–165. (in Ukrainian)
- KOSTINA E.V., AGAFONOV A.V. (2002). Electrophoretic study of polymorphism of grain storage proteins and histon H1 in *Elytrigia repens* (*Poaceae*). *Botanical journal*, **87**(3): 106–115. (in Russian)
- KRAMARETS V., BREDIHINA J.U. (2014). Syntaxonomy of spontaneous vegetation in the Melitopol region. *Proceedings of the Forestry Academy of Sciences of Ukraine*, **12**: 38–43. (in Ukrainian)

- KUCHERAVYI V., DANYLYK I., SKROBALA V., DANYLYK R. (2003). Urban transformation of vegetation cover in the upper part of the Dnister river basin. *Pratsi Naukovoho tovarystva im. Shevchenka. Ekolohichnyi zbirnyk. Ekolohichni problemy Karpatskoho rehionu*: 81–93. (in Ukrainian)
- KUZEMKO A.A. (2009). Meadow vegetation. *Molinio-Arrhenatheretea* class. Edit.-in-chief Yu.R. Shelyag-Sosonko. *Vegetation of Ukraine*. K.: Phytosociocentre: 376 p. (in Ukrainian)
- KUZEMKO A.A. (2011). Meadow-steppe vegetation of the National Dendrological Park Sofiyivka of the NAS of Ukraine and it's changes as a result of anthropogenic pressure. *Plant introduction*, **2**: 19–30. (in Ukrainian)
- KUZYARIN A. (2005). The The syntaxonomy of ruderal vegetation of flood plain ecosystems in the Western Bug river basin. *Proc. of the State Nat. Hist. Museum*, **21**: 29–52. (in Ukrainian)
- MELDERIS A., ET AL. (1980). *Flora Europaea Vol. 5 Alismataceae to Orchidaceae (Monocotyledones)*. Cambridge, UK: Cambridge University Press: 192–198.
- MELEGHIK O., SOLOMAKHA V., SOLOMAKHA T. (2008). Structure and adjective vegetations of grass-plots in Kyiv. *Thaiszia. J. Bot., Kosice*, **18**: 69–74.
- MOSYAKIN S., FEDORONCHUK M. (1999). *Vascular plants of Ukraine: a nomenclatural checklist*. Kiev: 345 p.
- MUCINA L., BÜLTMANN H., DIERBEN K., THEURILLAT J.-P., RAUS T., ČARNI A., ŠUMBEROVÁ K., WILLNER W., DENGLE J., GAVILÁN GARCÍA R., CHYTRÝ M., HÁJEK M., DI PIETRO R., IAKUSHENKO D., PALLAS J., DANIĚLS F.J.A., BERGMEIER E., SANTOS GUERRA A., ERMAKOV N., VALACHOVIČ M., SCHAMINÉE J.H.J., LYSENKO T., DIDUKH Y.P., PIGNATTI S., RODWELL J.S., CAPELO J., WEBER H.E., SOLOMESHCH A., DIMOPOULOS P., AGUIAR C., HENNEKENS S.M., TICHÝ L. (2016). Vegetation of Europe: hierarchical floristic classification system of vascular plant, bryophyte, lichen, and algal communities. *Applied Vegetation Science*, **19**(1): 1–783. doi: 10.1111/avsc.12257
- OLIJNIK M.P. (2014). Dynamika biomorfnoi struktury florokompleksiv perelohiv na stadiiakh vtorynoi suksesii. *Materialy I Vseukrainskoi naukovo-praktychnoi konferentsii molodykh vchenykh ta studentiv z mizhnarodnoiu uchastiu Dnipropetrovsk*: 227–229. (in Ukrainian)
- OLIJNIK M.P. (2017). Secondary succession of vegetation on abandoned lands of Transdnister Podillya. *Ukr. Bot. J.*, **74**(3): 276–283 (in Ukrainian). doi: 10.15407/ukrbotj74.03.276
- OSYPENKO V.V. (2006). *Spontaneous vegetation of Cherkasy*. Kyiv: Taras Shevshenko Kyiv National University (in Ukrainian).
- PARPAN V.I. OLIJNIK M.P. (2012). The alien fraction of the urban flora of the Prednistrovian Podillya old-fields ecosystems. *Ecology and noospherology*, **23** (3–4): 116–119. (in Ukrainian)
- PARPAN V.I., NESPLIAK O.S. (2011). The vegetation classification of the asheslag dumps of Burshtynska TEPS. *Scientific Bulletin of National Forestry University of Ukraine: Collection of scientific works, NLTUU*, **21**(5): 82–87. (in Ukrainian)
- PARPAN V., OLIJNIK M. (2013A). Direction of flora synanthropization changing on the fallows of Prednistrovian Podillya. *Visnyk of the Lviv University: (Series Biology)*, **63**: 133–140. (in Ukrainian)
- PARPAN V.I., OLIJNIK M.P. (2013B). Arboreal species natural restoration on the Pre-Dnister Podillya fallows. *Scientific Bulletin of National Forestry University of Ukraine: Collection of scientific works, NLTUU*, **23**(14): 8–15. (in Ukrainian)
- PASHKEVYCH N.A., HAVRYLOV S.O. (2012). Transformation of Vegetation Cover of Abandoned Fields in Shatsky National Nature Park. *Nature of Western Polissia and surrounding Areas*, **9**: 139–142. (in Ukrainian)
- PASHKEVYCH N.A., FITSAILO T.V. (2009). Synanthropic vegetation of transformed biotopes of Chernigiv region. *Ukr. Bot. J.*, **66**(2): 213–219. (in Ukrainian)
- PROKUDYN YU.N., VOVK A.H., PETROVA O.A. (1977). *Zlaki Ukrainy*. K: Nauk. dumka, 520 p. (in Ukrainian)
- SHEVCHYK O.O., KHOMIAK I.V. (2016). Otsinka florystychnykh resursiv pryrodnykh ekosystem dolyny richky Sluch. *Tezy Vseukrainskoi naukovo-praktychnoi konferentsii "Stalyi rozvytok krainy v ramkakh Yevropeiskoi intehtratsii", 27 zhovtnia 2016 roku. Zhytomyr*: 69–70. (in Ukrainian)
- SKROBALA V. (2009). Multidimensional typology of forest vegetation of the Ukraine: a regional level. *Scientific Bulletin of National Forestry University of Ukraine: Collection of scientific works, NLTUU*, **50**: 44–51. (in Ukrainian)
- SLIVINSKA K.A., BALASHOV L.S. (2006). Phytocoenotic composition of Przewalski's horse (*Equus przewalskii* Poljakov, 1881) feeding grounds in the Chornobyl exclusion zone. *Ukr. Bot. J.*, **63**(1): 22–30. (in Ukrainian)
- SOLOMAKHA I.V. (2005). Syntaxonomy of vegetation of forests and shrubs of the Northern Black Sea region. *Biological systems*, **7**(2): 236–243. (in Ukrainian)
- SOLOMAKHA V.A. (2008). *Syntaksonomiia roslynnosti Ukrainy. Tretie nablyzhennia*. Monohrafiia. Kyiv: Fitosotsiotsentr, 296 p. (in Ukrainian)
- SOLOMAKHA V.A., KOSTYLOV O.V., SHELIAH-SOSONKO YU.R. (1992). *Synantropna roslynnist Ukrainy*. Kyiv: Naukova dumka, 252 p. (in Ukrainian)
- SOROKA M.I. (2004). Flora and vegetation of natural reservation "Roztocze". *Scientific Bulletin of USUWFT*, **14**(8): 170–179. (in Ukrainian)

- SOROKA M.I. (2008). *Roslynnist Ukrainського Roztochchia*. Lviv: Svit, 434 p. (in Ukrainian)
- TSVELEV N.N. (1976). *Zlaki SSSR*. L.: Nauka, 788 p. (in Russian)
- TZVELEV N.N., PROBATOVA N.S. (2010). The genera *Elymus* L., *Elytrigia* Desv., *Agropyron* Gaertn., *Psathyrostachys* Nevski and *Leymus* Hochst. (*Poaceae: Triticeae*) in the flora of Russia. *V.L. Komarov Memorial Lectures*, **57**: 5–102. (in Russian)
- VOROBJOV YE.O., OLIJNYK M.P., SOLOMAKHA I.V. (2015). Syntaxonomy groups in small deciduous forests overgrown fallow. *Biological bulletin of Bogdan Chmelnytsky Melitopol state pedagogical university*. **5**(2): 54–63. (in Ukrainian)
- WEBER H. E., MORAVEC J. & THEURILLAT J.-P. (2000). International Code of Phytosociological Nomenclature. 3rd edition. *Journal of Vegetation Science*, **11**: 739–768.

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