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Evaluation of woody species in the selected parts of south-western Slovakia

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Abstract

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The research was performed in the city parks of Želiezovce and Levice which are situated in the dry and warm climatic region of the south-western part of Slovakia. Inventory of woody plants was done in period of May–September 2011. In the city park Želiezovce were found totally 98 woody species, of which 80% were broadleaves and 20% were coniferous species. The proportion of indigenous species reached 45%, in the case of introduced species it was 55%. In the city park Levice were found totally 111 woody species, of which 78% were broadleaves and 22% were coniferous species. The proportion of indigenous species reached 41%, in the case of introduced species it was 59%. In both city parks dominate the introduced species together with broadleaves species. There are presented also the selected growth parameters of significant woody species individuals. The two protected woody species were found – *Quercus pedunculiflora* K. Koch in the city park Levice and *Taxodium distichum* (L.) Rich in the city park Želiezovce.

Key words

city parks, inventory, protected species, tree parameters, woody species

Introduction

Biodiversity of vegetation is our biggest and the least appreciated wealth. Lost species cannot be replaced but the losses may be delayed. Attempt to save biodiversity itself is useful (Križová et al., 2007). One of the tools is establishment and maintenance of green urban objects in the cities. Park and garden design is a form of art that developed because of the need of higher society to represent itself in every culture. History of park and garden art goes back to the very beginning of civilization. The development can be traced since ancient times (Supuka and Feriancová, 2008).

The problem of woody species within park objects is mentioned by many authors. Hermann (1993) deals with the park tree species in Berlin City. Schipperijn et al. (2009) investigate city greenery in Denmark. LaPaix and Freedman (2010) mention city parks composition within Halifax region (in Canada). Other authors (Gómez-Muńoz et al., 2009; Gulezian and Nyberg, 2010; Chiesura, 2004) emphasize the importance of urban parks and decorative trees for sustainable development of cities.

Aim of our research was to perform a detailed inventory of woody species in Želiezovce city park and Levice city park as they are considered to be historically and dendrologically very valuable park objects of Slovakia, in regard to introduced tree species. Part of the research was also dedicated to the measurement of dendrometric parameters of significant individual trees.

Material and methods

The research was realized within the localities of Želiezovce city park (48º02' N, 018º39' E) and Levice city park (48º12' N, 018º36' E) in south-western Slovakia. Inventory of woody species was performed in the

park objects during May–September 2011. Parameters of significant woody plants were determined both for introduced and indigenous species. The most important were the trees with great dimensions. The collection of dendrometric data was oriented mainly on detection of the trunk girth (cm) and tree height (m), and also other qualitative parameters as horticulture value, health and vitality of the selected woody species according to Machovec (1987) and Pejchal (1996), modified by Modranský (2012). The soils were classified according to Bedrna et al. (2000). Plant taxa names are given according to Marhold and Hindák (1998) and cultivars according to Krüssmann (1984, 1985, 1986a, 1986b). Species origin is classified according to Gojdičová et al. (2002).

Ecological characteristics of the study area

The studied plots are located in the south-eastern part of Nitra region (Levice district, western Slovakia). Most of the district area is created with the Danube Lowland.

The localities are situated in the dry and warm climatic region with the mean annual temperature about 9.5 ºC and average annual precipitation 550–700 mm (Anonymus, 2005). The temperature and precipitation are connected with absolute altitude. The mountains in the north and north-east represent natural barrier against cold winds and significantly influence climatic conditions.

Within explored area predominate loamy and clay-loam soils. In the warmest parts of the area were from loess derived the luvisols (41.3%) and chernozems (26.2%) and along rivers there are eutric fluvisols (17.5%), mollic fluvisols (4.6%) and planosols (3.1%), (Anonymus, 2005). It is the territory that enables to the crops, even thermophilic ones, to grow in very favourable soil and climatic conditions. The vegetation belongs to the area of the middle-European and east-European thermophilic and xerophyte flora. Forest percentage is quite low, just 18.7%. Large forests occur within the adjacent Štiavnické vrchy Mts and Krupinská planina (plain). The fragments of floodplain forests may be found along the rivers Hron, Ipeľ, Krupinica, Sikenica and other smaller streams. On the warm southern slopes can be seen the introduced Black Locust stands (Anonymus, 2005).

In Želiezovce city park occurs floodplain forest with domination of Fluvisols and plant species *Aegopodium podagraria* Moench. Through the park flows the Vrbovec stream with the groundwater level depth of 2–3 m. In the soil profile can be seen small admixture of the quartz fragments. The litter fall is only sporadic. In Levice city park occurs the Fluvisols as well, with occurrence of small stones in profile. Nowadays in the territory of both park objects do not occur floods.

Results and discussion

The city park Želiezovce as a protected territory (3rd degree of protection) covers an area of 8 ha. Creation of the park dates back to the year 1875. It was established by Esterházy family as a free-style landscape park. The family built here a baroque castle in 1780. Many years Želiezovce city park was called Park of Franz Schubert in honour of important Austrian music composer. The park was created on the site of originally oak forest and it is one of the greatest historic parks of Slovakia accessible to the public.

In the park we recorded 1,123 specimens of woody species; 1,001 specimens belong to broadleaved and 122 specimens belong to coniferous taxa. According to the origin of woody species, we recorded 577 taxa of introduced species and 546 taxa of autochthonous tree species. Among the most remarkable trees in the park there are two specimens of *Quercus robur* L. considered as the oldest trees in the park (300–350 years old). Another remarkable tree is *Tilia cordata* Mill. (approximately 300 years old). It is followed by the group of introduced *Platanus* × *acerifolia* (Aiton) Willd. (200–250 years old). In the park may be also found alochthonous *Taxodium distichum* (L.) Rich which is the highest and the oldest protected bald cypress tree in Slovakia with the height of 24 m (approximately 200 years old). The tree comes from south-eastern part of the USA (Anonymus, 2010). Generally the trees in the park are in good condition. The most attention we paid to the dendrometrically significant trees (Table 1). We can conclude that the tree individuals with remarkable girth and height have average values of their horticulture value, health and vitality.

Inventory of woody species including growth parameters of the selected trees and their orchard value, health and vitality is shown in the Table 2. Based on the results of the field research we can conclude that in Želiezovce city park there are nowadays 98 woody species; 80% (78 species) are broadleaved and 20% (20 species) are conifers. From the number of 98 woody species, 45% (44 species) are autochthonous and 55% (54 species) are introduced tree species. Representation of the selected taxa groups of woody species in Želiezovce city park is shown in Figure 1.

In Želiezovce city park Benčať (1982) recorded woody species such as *Picea pungens* Engelm. cv. Argentea, *Thuja occidentalis* L., *Buxus sempervirens* L., *Aesculus hippocastanum* L., *Catalpa bignonioides* Walt., *Gleditsia triacanthos* L., *Sophora japonica* L., *Syringa vulgaris* L., *Celtis australis* L., *Fraxinus excelsior* L. cv. Nana, *Quercus rubra* L., *Tilia tomentosa* Moench and *Pseudotsuga menziesii* (Mirb.) Franco cv. Viridis, that were also recorded in 2011. Similarly like Benčať (1982) we also recorded robust individuals of the woody species *Gymnocladus dioicus* (L.) K. Koch and *Taxodium distichum* (L.) Rich. Benčať (1982) ex-

Table 1. Selected parameters of significant tree species individuals found in the studied city parks ($x \pm s_x$)

City park	Taxon	Origin	Girth [cm]	Height [m]	Orchard value	Health	Vitality
Železiovce	*Ginkgo biloba* L.	Introduced	188	22.5	5	5	5
	Gymnocladus dioicus (L.) K. Koch	Introduced	275	26.5	4	4	4
	Platanus × *hispanica* Münchh.	Introduced	300–418	38–46	3–5	3–5	3–5
	(12 trees evaluated)		348 ± 37	–	–	–	–
	Quercus robur L.	Native	338–570	18.5–29.5	3–5	3–5	3–5
	(3 trees evaluated)		445±117	25±6	4±1	4±1	4±1
	Rhamnus catharticus L.	Native	84	11.0	5	4	4
	Swida sanguinea (L.) Opiz	Native	67	12.5	5	3	3
	Taxodium distichum (L.) Rich	Introduced	387	24.0	5	5	5
	Ulmus laevis Pall.	Native	276	24	5	4	3
	Fagus sylvatica L.	Native	283	28	1	2	2
	Negundo aceroides Moench	Introduced	197	10	3	4	4
	Platanus occidentalis. L.	Introduced	446	32	1	2	2
Levice	*Quercus pedunculiflora* K. Koch	Native	450	28	2	3	3
	Quercus robur L.	Native	412	30	1	1	1
	Robinia pseudoacacia L.	Introduced	255.5	22	4	4	4
	Sambucus nigra L.	Native	131	9.5	1	2	2

Table 2. List of woody species in studied city parks

Taxon name	City parks	
	Železiovce	Levice
	Number of specimens	
Abies alba Mill.	–	1
Abies concolor (Gord.) Lindl.	2	–
Acer campestre L.	134	6
Acer platanoides L.	106	142
Acer platanoides L. cv. Atropurpurea	–	2
Acer pseudoplatanus L.	49	28
Acer saccharinum L.	1	–
Acer tataricum L.	3	–
Aesculus hippocastanum L.	61	23
Ailanthus altissima (Mill.) Swingle	35	45
Alnus glutinosa (L.) Gaertn.	3	–
Aucuba japonica cv. Variegata	–	1
Berberis julianae Schneid.	–	1
Berberis thunbergii DC.	–	1
Berberis thunbergii cv. Atropurpurea	–	2
Betula pendula Roth	15	17
Buxus sempervirens L.	2	6
Buxus sempervirens L. cv. Aureovariegata	–	2
Buxus sempervirens L. cv. Variegata	2	–
Caragana frutex (L.) K. Koch	–	1
Carpinus betulus L.	1	1
Carpinus betulus L. cv. Pendula	–	1
Castanea sativa Mill.	–	1

Table 2. List of woody species in studied city parks – continued

Taxon name	City parks	
	Želiezovce	Levice
	Number of specimens	
Catalpa bignonioides Walt.	3	22
Celtis australis L.	37	1
Celtis occidentalis L.	–	1
Cerasus avium (L.) Moench	5	5
Cerasus serrulata (Lindl.) London	1	1
Chamaecyparis lawsoniana (Murrai) Parl.	–	20
Cornus mas L.	1	–
Corylus avellana L.	24	6
Corylus colurna L.	–	2
Cotoneaster dammeri C. K. Schneid.	–	1
Cotoneaster elegans Rehd. & Wils.	4	–
Cotoneaster henryanus C. K. Schneid.	–	1
Cotoneaster horizontalis Decne.	–	2
Cotoneaster microphyllus Wall. ex Lindl.	–	2
Cotoneaster salicifolius Franch. var. henryanus	2	–
Cotinus coggygria Scop.	–	1
Crataegus monogyna Jacq.	2	1
Cryptomeria japonica (L. f.) D. Don	–	1
Deutzia scabra Thunb.	4	–
Elaeagnus angustifolia L.	2	2
Euonymus europaeus L.	5	2
Euonymus fortunei (Turcz.) Hand. – Mazz.	–	1
Euonymus japonicus Thunb. cv. Albovariegatus	1	–
Fagus sylvatica L.	5	1
Fagus sylvatica L. cv. Atropurpurea	–	3
Forsythia × intermedia Zab.	–	3
Forsythia suspensa (Thunb.) Vahl.	–	2
Forsythia viridissima Lindl.	3	–
Fraxinus angustifolia Vahl	1	–
Fraxinus excelsior L.	18	17
Fraxinus nigra Marsh.	6	–
Fraxinus ornus L.	–	4
Ginkgo biloba L.	1	–
Gleditsia triacanthos L.	4	1
Gymnocladus dioicus (L.) K. Koch	37	–
Hedera helix L.	On several trees	On several trees
Hypericum patulum Thunb.	–	1
Juglans regia L.	7	1
Juniperus communis L.	1	–
Juniperus conferta Parl.	1	–
Juniperus horizontalis Moench	–	5
Juniperus sabina L.	–	8
Juniperus squamata Buch. – Ham. ex D. Don var. fargesii	–	2
Juniperus virginiana L. cv. Grey Owl	13	3

Table 2. List of woody species in studied city parks – continued

Taxon name	City parks	
	Železovce	Levice
	Number of specimens	
Kerria japonica (L.) DC.	1	3
Koelreuteria paniculata Laxm.	3	15
Larix decidua Mill.	–	3
Laurocerasus officinalis M. Roem.	4	Hedge
Ligustrum ovalifolium Hassk.	–	1
Ligustrum ovalifolium Hassk. cv. Aureum	–	7
Ligustrum vulgare L.	–	Hedge
Lonicera japonica Thunb. cv. Aureo-reticulata	–	1
Lonicera nitida Wils.	–	1
Lonicera periclymenum L.	–	1
Lonicera xylosteum L.	–	1
Lonicera sp.	1	–
Magnolia sp.	–	10
Mahonia aquifolium (Pursh) Nutt	–	4
Malus domestica Borkh.	–	1
Malus × *purpurea* (Barbier) Rehd.	–	1
Negundo aceroides Moench	51	12
Parthenocissus quinquefolia (L.) Planch.	–	2
Paulownia tomentosa (Thunb.) Steud.	5	–
Padus avium Mill.	12	12
Pentaphylloides fruticosa (L.) O. Schwarz	–	1
Phellodendron amurense Rupr.	–	1
Philadelphus coronarius L.	10	9
Physocarpus opulifolius (L.) Maxim.	–	2
Physocarpus opulifolius (L.) cv. Diabolo	–	1
Physocarpus opulifolius (L.) cv. Luteus	–	1
Picea abies (L.) H. Karst.	1	8
Picea glauca (Moench) Voss. cv. Conica	–	2
Picea omorika (Pančic) Purk.	–	2
Picea orientalis (L.) Link.	4	–
Picea pungens Engelm.	5	3
Picea pungens Engelm. cv. Argentea	1	1
Pinus mugo Turra	–	1
Pinus nigra Arnold	3	34
Pinus rigida Mill.	1	–
Pinus sylvestris L.	7	2
Pinus wallichiana A. B. Jacks.	–	1
Platanus × *acerifolia* (Aiton) Willd. (in the valuated group of 12 pieces 9 healthy and 3 damaged)	43	–
Platanus occidentalis L.	–	12
Platycladus orientalis (L.) Franco	2	6
Populus sp.	–	6
Populus alba L.	1	–

Table 2. List of woody species in studied city parks – continued

Taxon name	City parks	
	Želiezovce	Levice
	Number of specimens	
Populus balsamifera (F. Michx.) A. Gray	1	–
Prunus cerasifera Ehrh. cv. Atropurpurea	3	4
Prunus cerasifera, subsp. cerasifera	–	4
Prunus domestica L.	1	–
Prunus spinosa L.	2	–
Pseudotsuga menziesii (Mirb.) Franco	1	4
Ptelea trifoliata L.	1	–
Pyracantha coccinea Roem.	–	Hedge + 10
Pyrus pyraster (L.) Burgsd.	1	–
Quercus pedunculiflora K. Koch	2	2
Quercus robur L.	23	1
Quercus rubra L.	2	–
Rhamnus catharticus L.	1	–
Rhododendron sp.	–	1
Rhus typhina L.	–	6
Ribes sp.	–	1
Robinia pseudoacacia L.	105	13
Rosa sp.	–	5
Salix matsudana Koidz. cv. Tortuosa	–	6
Salix fragilis L.	3	–
Salix × *rubra* Huds.	–	2
Salix sepulcralis Simonk.	2	–
Sambucus nigra L.	30	7
Sarothamnus scoparius (L.) K. Koch	–	1
Sophora japonica L.	1	1
Sorbus aria (L.) Crantz. cv. Lutescens	–	1
Sorbus aucuparia L.	–	1
Spiraea douglasii Hook.	2	1
Spiraea media F. Schmidt	–	1
Spiraea × *vanhouttei* (Briot) Zab.	2	2
Swida alba L.	–	16
Swida sanguinea (L.) Opiz	11	–
Symphoricarpos albus (L.) S. F. Blake	–	6
Syringa vulgaris L.	5	3 bunches + 11
Syringa sp.	1	8 bunches + 14
Tamarix sp.	–	–
Taxodium distichum (L.) Rich	5	–
Taxus baccata L.	21	11
Thuja occidentalis L.	25	13
Thuja occidentalis L. cv. Aurea	–	2
Thuja occidentalis L. cv. Globosa	–	1
Thuja occidentalis L. cv. Douglasii Aurea	–	1
Thuja plicata D. Don	20	3
Thuja plicata D. Don cv. Zebrina	–	1

Table 2. List of woody species in studied city parks – continued

Taxon name	City parks	
	Želiezovce	Levice
	Number of specimens	
Tilia cordata Mill.	10	5
Tilia × *euchlora* K. Koch	8	1
Tilia × *europaea* L.	10	–
Tilia platyphyllos Scop.	–	23
Tilia platyphyllos Scop. subsp. platyphyllos	13	19
Tilia platyphyllos Scop. cv. Rubra	18	–
Tilia tomentosa Moench	8	–
Torreya taxifolia Arnott		1
Ulmus carpinifolia Gleditsch.	18	–
Ulmus laevis Pall.	8	5
Viburnum lantana L.	5	14
Viburnum × *pragense* Vik	6	20
Viburnum rhytidophyllum Hemsl.	14	13
Weigela florida Bge. A. DC.	–	2

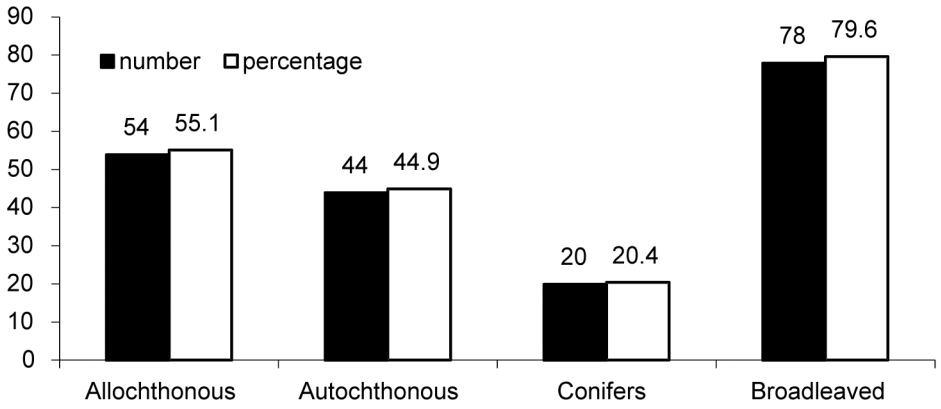

Fig. 1. Representation of selected taxonomic groups of woody species in the city park Želiezovce.

cept that also recorded species such *Pinus nigra* Arnold, *Chaenomeles speciosa* (Sweet) Nakai, *Juglans nigra* L., *Aesculus parviflora* Walt., *Corylus colurna* L., *Cotinus coggyria* Scap. and *Platanus orientalis* L., that we did not recorded in 2011 anymore.

Levice city park consists of an old and a new part. Historic part covers an area of 1.74 ha and it was created in 1879 (Tolnai, 2006). In this part can be found protected autochthonous tree *Quercus pedunculiflora* K. Koch. The old part is the source of valuable woody species, however, it is rather neglected.

The new part covers an area of 3.4 ha and it was created in 1997. Here may be seen the statue of M. R. Štefánik. Another attraction is a bridge over an artificial lake with a fountain and terrace for people. The new part is nowadays regularly maintained.

In both parts of Levice city park that are free accessible to the public there are growing altogether 880 specimens of woody species; 456 specimens belong to introduced trees and 424 specimens are autochthonous. Introduced woody species are represented by species such as *Negundo aceroides* Moench, *Platanus occidentalis* L., *Robinia pseudoacacia* L. and autochthonous species are represented e.g. by *Fagus sylvatica* L., *Sambucus nigra* L., *Quercus pedunculiflora* K. Koch and *Quercus robur* L. The most attention we paid to the dendrometrically significant trees (Table 1). We can state that the tree individuals with remarkable girth and height have average values of their garden value, health and vitality. Rather worse health was recorded e.g. for *Robinia pseudoacacia* L. On the other hand, specimen of *Quercus robur* L. (approximately 200 years old) is

an example of longevity and resistance with relatively good health.

Inventory of woody species including growth parameters of the selected trees and their garden value, health and vitality is shown in the Table 2. We can conclude that in Levice city park there are growing today altogether 111 woody species; 78% (87 species) are broadleaved and 22% (24 species) are conifers. From the number of 111 woody species, 41% (46 species) are autochthonous and 59% (65 species) are introduced tree species. Representation of the selected taxa groups of woody species in Levice city park is shown in Figure 2.

In Levice city park Benčať (1982) recorded woody species such as *Pinus strobus* L., *Pinus cembra* L., *Pinus ponderosa* Dougl. ex Laws., *Iberis sempevirens* L., *Chaenomeles speciosa* (Sweet) Nakai, *Polygonum baldschuanicum* Regel., *Cercis siliquastrum* L., *Gymnocladus dioicus* (L.) K. Koch, *Hydrangea arborescens* L., *Cephalotaxus harringtonia* cv. Fastigiata, *Santolina chamaecyparissus* L., *Stranvaesia davidiana* Decne. and *Jasminum nudiflorum* Lindl., that we did not recorded in 2011 anymore.

In Želiezovce and Levice city parks we recorded together 28 significant trees with remarkable dendrometric parameters that are shown in Table 1. From this number, 21 trees were recorded in Želiezovce city park and 7 ones in Levice city park. In Želiezovce city park, very valuable was the group of 12 trees of *Platanus* × *acerifolia* (Aiton) Willd. and three specimens of *Quercus robur* L.

Regarding to the origin of woody species, in Želiezovce park were recorded four native tree species interesting with their growth parameters (*Quercus robur* L., *Rhamnus catharticus* L., *Swida sanguinea* (L.) Opiz, *Ulmus laevis* Pall.) and four interesting introduced species (*Ginkgo biloba* L., *Gymnocladus dioicus* (L.) K. Koch, *Platanus x acerifolia* (Aiton) Willd., *Taxodium distichum* (L.) Rich). In Levice city park there were found four significant specimens of native tree species with remarkable growth parameters (*Quercus robur* L., *Quercus pedunculiflora* K.Koch, *Fagus sylvatica* L., *Sambucus nigra* L.) and three specimens of interesting introduced species (*Negundo aceroides* Moench, *Platanus occidentalis*. L., *Robinia pseudoacacia* L.).

Among woody species from America belong: *Juniperus horizontalis* Moench, *Gleditsia triacanthos* L., *Robinia pseudoacacia* L., *Negundo aceroides* Moench, *Catalpa bignonioides* Walt., *Mahonia aquifolium* (Pursh) Nutt, *Parthenocissus quinquefolia* C. K. Schneid., *Pseudotsuga menziesii* (Mirb.) Franco, *Picea pungens* Engelm., *Quercus rubra* L., *Symphoricarpos albus* (L.) S. F. Blake, *Abies concolor* (Gord.) Lindl., *Thuja occidentalis* L., *Acer saccharinum* L., *Rhus typhina* L. and *Chamaecyparis lawsoniana* (Murrai) Parl. From Asian regions originate following tree species: *Berberis thunbergii* DC., *Pyracantha coccinea* M. Roem., *Corylus colurna* L., *Ginkgo biloba* L., *Prunus cerasifera* Ehrh., *Swida alba* (L.) Opiz, and *Kerria japonica* (L.) DC. Of Japan origin is the species *Weigela florida* Bge. A. DC. and *Lonicera japonica* Thunb. cv. Aureo-reticulata. Among Chinese species recorded in studied parks there are growing *Platycladus orientalis* L., *Berberis julianae* Schneid., *Viburnum rhytidophyllum* Hemsl., *Ailanthus altissima* (Mill.) Swingle and *Cerasus serrulata* (Lindl.) London.

In studied park objects grow following invasive neophytes: *Robinia pseudoacacia* L., *Negundo aceroides* Moench and *Ailanthus altissima* (Mill.) Swingle. Among potential (regional) invasive species were included: *Elaeagnus angustifolia* L., *Mahonia aquifolium* (Pursh) Nutt., *Parthenocissus quinquefolia* (L.) Planch., *Rhus typhina* L. and also *Gymnocladus dioica* (L.) K. Koch. Frequently escaping species were: *Aesculus hippocastanum* L., *Cotoneaster horizontalis* Decne., *Gleditsia triacanthos* L., *Quercus rubra* L. and *Syringa vulgaris* L.

As regards growth parameters, i.e. girths and heights of the mentioned significant trees, to the tallest tree specimens belonged certainly *Quercus robur* L. (with average girth 445 ± 117 cm and height 25 ± 6 m)

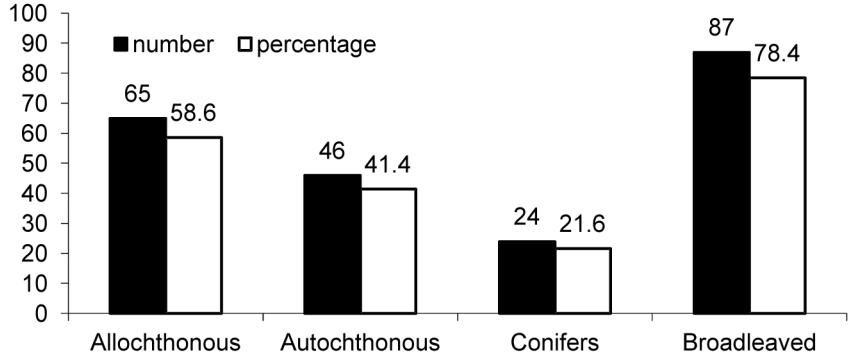

Fig. 2. Representation of selected taxonomic groups of woody species in the city park Levice.

and *Platanus* × *acerifolia* (Aiton) Willd. (with average girth 348 ± 37 cm and height 32 m) in Želiezovce city park (Table 1). Both trees have relatively favourable garden value, health and vitality. Moreover, specimens of two protected woody species were found. The first one belongs to *Quercus pedunculiflora* K. Koch (with girth 450 cm and height 28 m) in Levice city park, and another one is *Taxodium distichum* (L.) Rich (with girth 387 cm and height 24 m) in Želiezovce city park.

Conclusions

During May–September 2011 we performed inventory of woody species in Želiezovce city park and Levice city park. The representation of introduced and autochthonous woody species was determined and processed in tables. In Želiezovce city park we recorded 1,123 specimens of woody species; 577 specimens of introduced species and 546 specimens of autochthonous species. In both parts of Levice city park there were altogether growing 880 specimens of woody species; 456 specimens belonged to introduced trees and 424 specimens were autochthonous.

Together 28 significant trees with remarkable dendrometric parameters were recorded in both park objects. We recorded robust native woody species (*Quercus robur* L., *Rhamnus catharticus* L., *Swida sanguinea* (L.) Opiz, *Ulmus laevis* Pall.) as well as interesting introduced tree species originating from North America and Asia (Japan and China). Moreover, in the parks were found individuals of invasive neophytes, potential (regional) invasive species and also frequently escaping ones. Two protected woody species were found, Pedunculate Oak (in Levice city park) and Bald Cypress (in Želiezovce city park).

We can conclude that in both studied parks there predominated native tree species. From introduced trees there predominated species originating especially from North America. The research results showed that allochthonous woody species are important elements of both investigated parks. The results were compared with data issued in the work of Benčať (1982).

The territory of south-western Slovakia is very suitable place for the growth of many tree species because of suitable climatic and soil conditions. Investigation of exotic tree species ought to be performed permanently in both park objects.

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Dendrologicko-ekologické zhodnotenie drevinového zloženia vo vybraných parkoch juhozápadného Slovenska

Súhrn

V práci sme sa venovali dendrologicko-ekologickému výskumu drevinového zloženia vo vybraných parkových objektoch juhozápadného Slovenska (mestský park Železiovce a Levice) s dôrazom na výskyt introdukovaných drevín. Vyhodnotili sme rastové parametre vzrastovo nadpriemerných jedincov (obvod kmeňa, výška), ich sadovnícku hodnotu, zdravotný stav a vitalitu. Získané výsledky sme porovnali s údajmi uvedenými v práci Benčaťa (1982).

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