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The vegetation of "Dzięcioły" earthwork (Siedlecka Plateau)

Szata roślinna grodziska „Dzięcioły" (Wysoczyzna Siedlecka)

SUMMARY

The early-medieval earthwork "Dzięcioły", of the area of 8 ha, is situated in the Sarnaki forest district (Mazovia Province). The whole object is overgrown by deciduous forest vegetation. Two well-preserved subassociations of oak-hornbeam forest – *Tilio-Carpinetum typicum* and *T.-C. corydaletosum*, protected by Nature 2000 Directive, were identified. The flora of the earthwork includes 184 vascular plant species, of which 5 are protected and 6 regionally threatened. Species characteristic of deciduous forests and forest edge communities (63.6%) dominate over meadow (16.3%) and aquatic and rush plants (13.6%). The share of synanthropic species is still very low (6.0%). Due to large archaeological and natural values, spatial protection of the earthwork as a nature reserve, was suggested.

Keywords: "Dzięcioły" earthwork, Siedlecka Plateau, *Tilio-Carpinetum*, nature conservation

STRESZCZENIE

Wczesnośredniowieczne grodzisko „Dziecioły", o powierzchni ok. 8 ha, położone jest w nadleśnictwie Sarnaki (województwo mazowieckie). Cały obiekt porośnięty jest lasem liściastym. Na terenie tym zidentyfikowano dwa dobrze zachowane podzespoły grądowe: *Tilio-Carpinetum typicum* i *T.-C. corydaletosum*, chronione w ramach programu Natura 2000. Flora grodziska obejmuje 184 gatunki naczyniowe, w tym 5 gatunków chronionych i 6 zagrożonych regionalnie. Gatunki typowe dla lasów liściastych i ich okrajków (63,6%) przeważają nad roślinami łąkowymi (16,3%) oraz wodnymi i szuwarowymi (13,6%). Udział gatunków synantropijych jest nadal bardzo niski (6,0%). Ze względu na wysokie walory archeologiczne i przyrodnicze zaproponowano ochronę grodziska w formie rezerwatu przyrody.

Słowa kluczowe: grodzisko „Dzięcioły", Wysoczyzna Siedlecka, ochrona przyrody

INTRODUCTION

The early-medieval earthwork "Dzięcioły", called by local inhabitants "trenches" is considered as one of the best preserved archaeological objects in the southern Podlasie region (5). It was supposedly the most significant settling center in that region. The area situated among swamps by the Toczna River provided safety for the inhabitants. From the south-west there was a suburb settlement. The whole described area was surrounded by moat and two rings of embankments. In the entirety it was one of the most important fortified objects in the region. Marshy grounds and frequent river floods did not contribute to farthest development of the settlement. It was finally relocated 5 km away into an elevated, drier area, giving rise to present-day Łosice.

At the beginning of the 20th century, the investigated area was overgrown by meadow vegetation. Trees, surrounding the earthwork from the south were cut down before Word War I and subsequently the whole area has been treated as a pasture for a long time (11). Forest communities have developed in the borders of the earthwork after cessation of agricultural use as a result of natural succession and tree planting.

STUDY AREA

The "Dzięcioły" earthwork is situated in the eastern part of the Masovia Province, about 5.5 km to the north-east of Łosice. Its geographic coordinates are: 52°15'10''N and 22°46'25''E. Its eastern borders are surrounded by the riverbed of the Toczna river (Bug tributary), whereas from the

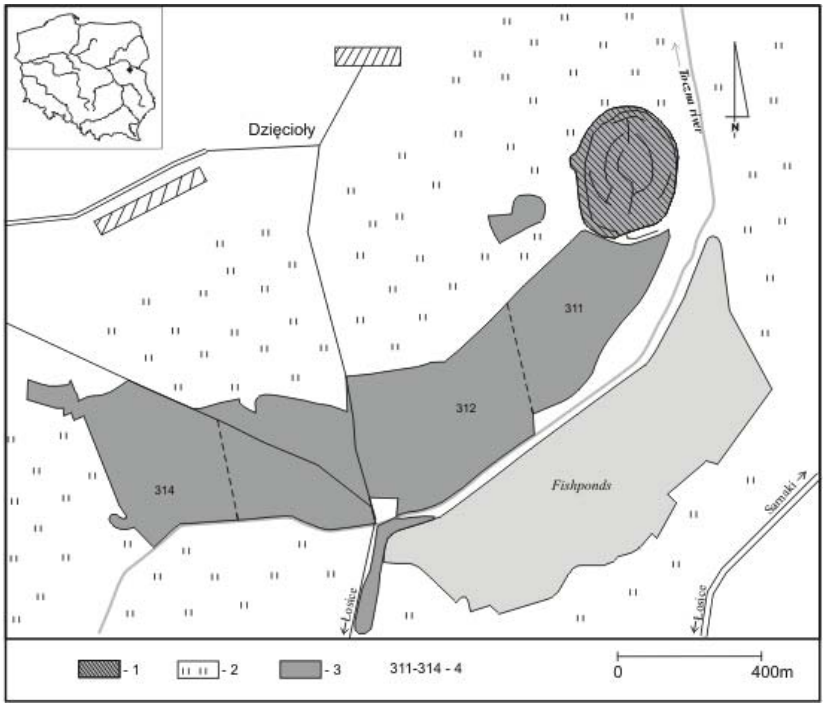

Fig. 1. Location of the "Dzięcioły" earthwork. 1 – "Dzięcioły" earthwork, 2 – meadow, 3 – forest, 4 – numbers of forest sections.

south it adjoins to the complex of state forest (section 311 of Woźniki Range, Sarnaki forest district) (Fig. 1). The whole area of settlement (about 8 ha including embankments) is a private property at present.

The earthwork has an oval shape, elongated from north to south. Dimensions of its central part (without embankments) are 325 x 225 m. The settlement is surrounded by a double ring of embankments, reaching the height of 3–4 m from the south. From the north they are partially destroyed and usually lower. Well preserved moat, periodically filled with water is observed only from the south. Additional embankments inside the area of the settlement delimited its inner part (about 1.6 ha). The investigated area is crossed by sporadically attended forest road. Thickness of the cultural layer varies from 40 cm in the center of the earthwork to 30 cm outside. Valuable fragments of earthenware crockery were collected during archaeological research carried out in the 60's (5).

According to physical-geographic division of Poland by Kondracki (7) the studied area is located in the macroregion of the Południowopodlaska Lowland and the Siedlecka Plateau mesoregion. The mesoregion has mainly a character of flat plain, built up by sands of glacial accumulation of Middle Poland glaciation, diversified by moraine formations and river valleys.

The earthwork is situated in the Siedlecka Plateau mesoregion, belonging to 4th Mazowiecko-Podlaski District according to the natural-forest division of Poland (14), based on ecological and physiographical grounds. The mesoregion is distinguishable by a low share of forest areas, distinct domination of pine forests, lack of beech and fir forest stands and only a little share of spruce. The habitats of moderately moist coniferous forests and moderately moist mixed forests, characterized by low productivity, dominate.

MATERIAL AND METHODS

Studies on vegetation of the "Dzięcioły" earthwork were carried out in 2010 and 2011. The floristic list and 25 phytosociological relevés were made in the object according to the Braun-Blanquet method (13). Phytosociological and floristic documentation was prepared in the early-spring period and completed in the furthest vegetation seasons.

Classification of the distinguished plant communities and phytosociological attachment of species was based on Matuszkiewicz (10). Nomenclature of species was adopted after Mirek et al. (12). According to the idea of ecological indicator values (17), the analysis of requirements of species with respect to light, trophy, humidity and habitat reaction was made. The basic life form of plants (17) and attachment to historical-geographical groups (6, 15, 16) were also determined. Endangered plant species were selected on the basis of regional list prepared by Głowacki et al. (4).

The aim of the paper is presentation of floristic and phytosociological value of the archeological object "Dzięcioły" and suggestion of its legal protection.

RESULTS OF STUDIES

Plant communities

Two subassociations of oak-hornbeam forest – *Tilio-Carpnetum typicum* and *Tilio-Carpinetum corydaletosum* were distinguished in the studied area. Moreover, the community similar to alder forest from the class *Alnetea glutinosae* was noted in local depressions, periodically filled with water. It represents one of the succession stages toward wet oak-hornbeam forest.

In the canopy of *Tilio-Carpnetum typicum* (cover 70–90%) prevail: *Tilia cordata*, *Quercus robur* and in lower layers – *Carpinus betulus* (Tab. 1). The shrub

Table 1. Plant communities of the "Dzięcioły" earthwork, state from the year 2011 (A – *Tilio cordatae-Carpinetum betuli typicum* Tracz 1962, B – *Tilio cordatae-Carpinetum betuli corydaletosum* Tracz 1962, C – community from the class *Alnetea glutinosae*).

Community	Layer	A	B	C
Cover of layer a (%)		70-90	70-90	30-50
Cover of layer b (%)		10-60	30-60	30-40
Cover of layer c (%)		70-90	80-100	60-80
Trees and shrubs:				
Corylus avellana	bc	V^{1-3}	V^{1-2}	V^{+-2}
Tilia cordata	a	IV^{1-2}	V^{1-3}	V^{1-2}
Tilia cordata	bc	III^{1-2}	V^{+-1}	II^{+}
Sorbus aucuparia	bc	III^{1}	III^{+-1}	IV^{+-1}
Carpinus betulus	a	V^{2-4}	V^{2-3}	III^{1}
Carpinus betulus	bc	V^{1-3}	V^{1-2}	II^{1}
Quercus robur	a	V^{2-4}	V^{2-3}	.
Quercus robur	bc	III^{+-1}	V^{+-1}	.
Lonicera xylosteum	bc	V^{+-2}	IV^{+-1}	I^{+}
Acer platanoides	a	III^{1}	III^{1-2}	I^{1}
Euonymus verrucosus	bc	II^{1}	III^{1-2}	.
Fraxinus excelsior	bc	I^{1}	II^{+-1}	
Padus avium	bc	I^{+}	IV^{1}	V^{1-2}
Ulmus minor	a	I^{1}	III^{2}	III^{1-2}
Ulmus minor	bc	II^{1}	III^{1-2}	V^{+-2}
Ribes spicatum	bc	.	III^{1-2}	V^{+-2}
Alnus glutinosa	a	.	.	IV^{2}
Alnus glutinosa	bc	.	II^{+}	IV^{1-3}
Sambucus nigra	bc	.	I^{1}	V^{+-1}
Ribes nigrum	bc	.	.	IV^{+-1}
Cornus sanguinea	bc	.	I^{+}	V^{1-3}
Crataegus monogyna bc A (I^{+}), B (I^{r}); *Frangula alnus* bc A (III^{+-1}), C (I^{+}); *Viburnum opulus* bc A (I^{+}), B (I^{+}); *Pyrus communis* bc A (I^{1}); *Picea abies* bc A (I^{1}); *Populus tremula* a B (III^{1-2}); *P. tremula* bc B (I^{1}); *Padus avium* a B (I^{1}); *Betula pubescens* bc B (I^{+}); *Euonymus europaeus* bc C (II^{+-1}); *Salix cinerea* bc C (I^{2})				
Ch. *Querco-Fagetea*				
Anemone nemorosa	c	V^{2-3}	V^{2-4}	V^{+-2}
Aegopodium podagraria	c	V^{+-4}	V^{+-4}	III^{2-3}
Melica nutans	c	V^{+-3}	V^{+-2}	III^{+}
Hepatica nobilis	c	V^{+-2}	V^{+-2}	I^{r}
Poa nemoralis	c	V^{+-2}	III^{+-3}	.
Moehringia trinervia	c	III^{+-1}	III^{+-1}	I^{+}
Brachypodium sylvaticum	c	II^{+-1}	III^{1-2}	.

Viola riviniana A (III^{+-1}), B (I^{+}); *Campanula trachelium* A (I^{r}), B (III^{r-1}); *Carex digitata* A (II^{+-1}), B (I^{+}); *Epipactis helleborine* A (II^{r}), B (I^{r}); *Ranunculus auricomus* A (II^{+}), B (I^{1})

Ch. *Fagetalia sylvaticae*				
Polygonatum multiflorum		V^{+-2}	V^{+-1}	V^{+-1}
Lathyrus vernus	c	III^{+-2}	IV^{+-2}	III^{+-1}
Scrophularia nodosa	c	IV^{+-1}	IV^{r-1}	III^{+-1}
Ranunculus lanuginosus	c	IV^{r-+}	III^{1}	III^{+-1}
Galeobdolon luteum	c	V^{2-4}	V^{1-4}	III^{1}
Pulmonaria obscura	c	V^{r-2}	V^{+-2}	III^{1-2}
Milium effusum	c	V^{+-2}	V^{+-2}	II^{+-1}
Viola reichenbachiana	c	III^{+}	V^{+-2}	I^{+}
Ranunculus cassubicus	c	II^{r-+}	III^{+}	.
Anemone ranunculoides	c	I^{+}	V^{1-2}	II^{+-1}
Asarum europaeum	c	III^{+}	V^{r-3}	I^{1}
Corydalis cava	c	I^{1}	V^{+-3}	.
Isopyrum thalictroides	c	.	V^{1-2}	I^{r}
Corydalis solida	c	.	V^{r-2}	.
Impatiens noli-tangere	c	.	III^{1-2}	V^{+-3}

Adoxa moschatellina A (III^{r-1}), B (III^{+}); *Paris quadrifolia* A (III^{r-+}), B (III^{+-1}); *Dryopteris filix-mas* A (II^{r-+}); *Stachys sylvatica* B (II^{1})

Ch. *Carpinion betuli*				
Stellaria holostea	c	V^{1-3}	V^{+-4}	III^{1-2}
Galium schultesii	c	V^{+-3}	V^{+-4}	II^{1-2}
Dactylis polygama	c	II^{+}	III^{r-+}	I^{r}
Viola mirabilis	c	I^{+}	III^{+-1}	.
Ch. *Alno-Ulmion*				
Ficaria verna	c	I^{+}	V^{+-3}	IV^{+-1}
Festuca gigantea	c	.	III^{1}	V^{+-2}
Gagea lutea	c	.	V^{+-1}	I^{+}
Stellaria nemorum	c	I^{2}	III^{1-2}	.
Ch. *Alnetea glutinosae*				
Solanum dulcamara	c	.	.	IV^{+-3}
Lycopus europaeus	c	.	.	III^{1-3}
Thelypteris palustris	c	.	.	I^{2}
Ch. *Glechometalia*				
Geum urbanum	c	V^{+-2}	V^{r-2}	V^{+-1}
Glechoma hederacea	c	III^{1-2}	V^{r-2}	V^{+-2}
Chaerophyllum aromaticum	c	.	III^{2-3}	III^{1-3}
Alliaria petiolata	c	I^{r}	II^{r-+}	III^{+-1}
Lamium maculatum	c	.	IV^{+-1}	I^{+}
Galium aparine	c	.	.	V^{+-3}

Geranium robertianum	c	.	.	V^{+-2}
Anthriscus sylvestris	c	.	.	II^{r-+}

Epilobium montanum A (II^{r}), B (I^{r}); *Lapsana communis* A (II^{+-1}); C (I^{r}); *Fallopia dumetorum* A (I^{r}); *Impatiens parviflora* C (I^{+});

Ch. *Molinio-Arrhenatheretea*

Vicia cracca	c	II^{r-+}	.	II^{+}
Geranium palustre	c	I^{r}	.	II^{+-1}
Lysimachia nummularia	c	I^{+}	.	V^{+-2}
Geum rivale	c	.	.	V^{+-2}
Lysimachia vulgaris	c	.	.	V^{+-2}
Ranunculus repens	c	.	.	V^{+-2}
Stachys palustris	c	.	.	IV^{r-2}
Symphytum officinale	c	.	.	IV^{r-2}

Caltha palustris C (II^{+-1}); *Deschampsia caespitosa* C (II^{+-1}); *Filipendula ulmaria* C (II^{+-1}); *Equisetum palustre* C (II^{+-1}); *Lythrum salicaria* C (II^{r})

Ch. *Phragmitetea*

Galium palustre	c	.	.	IV^{+-3}
Carex bohemica	c	.	.	III^{r-+}
Equisetum fluviatile	c	.	.	III^{r-+}
Phragmites australis	c	.	.	II^{2-3}
Hottonia palustris	c	.	.	II^{1}
Oenanthe aquatica	c	.	.	II^{r-1}
Carex gracilis	c	.	.	I^{+}
Iris pseudacorus	c	.	.	I^{+}

Accompanying sp.:

Maianthemum bifolium	c	V^{+-3}	V^{+-2}	II^{+-1}
Melampyrum nemorosum	c	IV^{1-3}	III^{+-2}	.
Ajuga reptans	c	III^{1}	V^{r-2}	I^{+}
Urtica dioica	c	I^{r}	III^{1-3}	V^{+-3}
Dryopteris carthusiana	c	III^{+-2}	.	V^{+-1}
Galeopsis pubescens	c	III^{+-1}	II^{r}	III^{r-+}
Convallaria majalis	c	III^{+-2}	III^{+-1}	.

Solidago virgaurea A (III^{r-1}); *Veronica chamaedrys* A (III^{+-1}); *Campanula rapunculoides* A (II^{+}); *Bromus japonicus* A (II^{+}); *Galeopsis bifida* A (II^{+}); *Hypericum perforatum* A (II^{r}); *Pteridium aquilinum* A (I^{+}); *Fragaria vesca* B (I^{+}); *Rubus idaeus* C (II^{+-1}), *Rubus caesius* C (I^{1})

layer (cover 10–60%) consists of *Corylus avellana*, *Frangula alnus*, *Lonicera xylosteum*, more rarely *Sorbus aucuparia*, *Euonymus verrucosus* and brushwood of above mentioned trees. Species characteristic of the class *Querco-Fagetea* (*Anemone nemorosa*, *Aegopodium podagraria*, *Melica nutans*, *Hepatica nobilis*, *Poa nemoralis*) and ordo *Fagetalia sylvaticae* (*Polygonatum multiflorum*, *Galeobdolon luteum*, *Milium effusum*, *Pulmonaria obscura*, *Scrophularia nodosa*) dominate in rich, well developed herb layer (cover 70–90%). From among plants characteristic of oak-hornbeam forests, the most frequent are: *Stellaria holostea* and *Galium schultesii* (constancy – V). The share of species characteristic of the class *Alnetea glutinosae* and *Alno-Ulmion* alliance, as well as meadow and rush taxa is low. Several accompanying species, e.g., *Maianthemum bifolium, Ajuga reptans, Galeopsis pubescens, Convallaria majalis, Solidago virgaurea* and *Veronica chamaedrys* are also frequently noted.

The canopy of *Tilio-Carpinetum corydaletosum* (cover 70–90%) is dominated by *Quercus robur*, *Tilia cordata* and in the lower layer – *Carpinus betulus*. Besides a large share of *Ulmus minor* was noted in some plots. In a well-developed shrub layer (cover 30–60%) prevail: *Corylus avellana*, *Padus avium*, *Euonymus verrucosa*, *Lonicera xylosteum*, *Ribes spicatum* and brushwood of above mentioned trees. The floristic composition of a herb layer (cover 80–100%) differs from *Tillio-Carpinetum typicum* by constant occurrence of such species from ordo *Fagetalia sylvaticae*, as, *Anemone ranunculoides*, *Asarum europaeum*, *Corydalis cava*, *C. solida* and *Isopyrum thalictroides*. In the association *Tilio-Carpinetum corydaletosum* there are present both species characteristic of alliance *Carpinion betuli* (*Stellaria holostea*, *Galium schultesii*, *Dactylis polygama*, *Viola mirabilis*), and these typical of the alliance *Alno-Ulmion* (*Ficaria verna*, *Gagea lutea*, *Stellaria nemorum* and *Festuca gigantea*). Lack of meadow, rush and alder forest species is also characteristic. A large share of wet forest edge species from ordo *Glechometalia* (e.g.: *Geum urbanum*, *Glechoma hederacea*, *Lamium maculatum* and *Chaerophyllum aromaticum*) was noted. A constant occurrence of accompanying species – *Maianthemum bifolium* and *Ajuga reptans* was also observed.

A community similar to alder forests from the class *Alnetea glutionosae* was noted along the moats, periodically filled up with water. The cover of canopy layer, with domination of *Tilia cordata*, *Alnus glutinosa* and *Ulmus minor*, varied from 30 to 50%. The shrub layer (cover 30–40%) consists of such species, as, *Padus avium*, *Corylus avellana*, *Sorbus aucuparia*, *Sambucus nigra*, *Ribes spicatum*, *R. nigrum* and brushwood of above mentioned trees. In the herb layer dominate species of alluvial, riverside forests, alder forests as well as meadow, rush and aquatic plants. A large share of species characteristic of the alliance *Alno-Ulmion* (*Festuca gigantea*, *Ficaria verna*) and the class *Alnetea glutinosae* (*Solanum dulcamara*, *Lycopus europaeus*, locally *Thelypteris palustris*) was noted. Among

the species characteristic of the class *Querco-Fagetea* with a large constancy and coverage occur only: *Anemone nemorosa*, *Impatiens noli-tangere*, *Polygonatum multiflorum* and *Aegopodium podagraria*. A share of oak-hornbeam species is low. The community is distinguishable from plots of oak-hornbeam forests by occurrence of numerous meadow species (e.g.: *Lysymachia nummularia*, *L. vulgaris*, *Geum rivale*, *Ranunculus repens*, *Stachys palustris*, *Symphytum officinale*) as well as aquatic and rush plants (e.g.: *Galium palustre*, *Carex bohemica*, *Equisetum fluviatile*). A high participation of forest edge species from ordo *Glechometalia*, e.g: *Glechoma hederacea*, *Geum urbanum*, *Galuim aparine*, *Geranium robertianum*, *Chaerophyllum aromaticum*, *Alliaria petiolata* was observed. Among the accompanying species the most frequent are: *Urtica dioica* and *Dryopteris carthusiana*.

Flora

Vascular flora of the "Dzięcioły" earthwork consists of 184 species belonging to 61 families. The most numerous species are: *Asteraceae* and *Poaceae* (13 species each), *Rosaceae* and *Lamiaceae* (11 each), *Ranunculaceae* and *Apiaceae* (10 each). Considering the life forms, the most frequent are hemicryptophytes (44.6%), phanerophytes (18.5%) and geophytes (16.8%). Native species (96.7%) clearly prevail over anthropophytes. Among the species brought to Poland are: two archaeophytes (*Atriplex patula, Senecio vulgaris*), three kenophytes (*Impatiens parviflora, Oxalis fontana, Sambucus racemosa* – species unfamiliar regionally) and only one rarely noted diaphyte – *Bromus japonicus*.

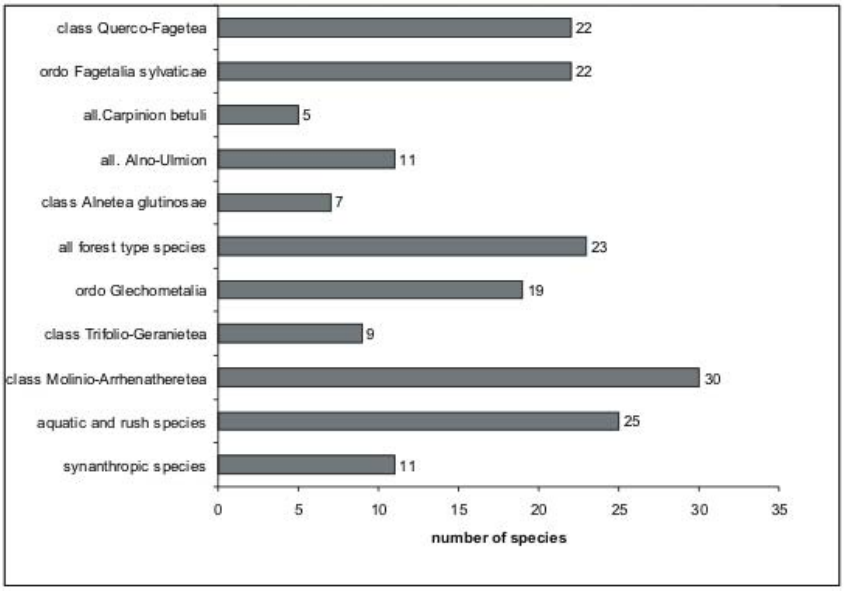

Fig. 2. Phytosociological structure of the flora of the "Dzięcioły" earthwork.

According to the character of the object, most species (63.6 %) are typical of forest, shrub and forest edge communities (Fig. 2). From among forest species, the most frequent are these, characteristic of class *Querco-Fagetea* (22–11.9%) and ordo *Fagetalia sylvaticae* (22–11.9%), e.g: *Anemone nemorosa*, *Aegopodium podagraria, Hepatica nobilis, Galeobdolon luteum*, *Melica nutans, Milium effusum*, *Polygonatum multiflorum, Pulmonaria obscura*. Domination of: *Corydalis solida*, *C. cava, Anemone ranunculoides* and *Isopyrum thalictroides* was observed in moist habitats. A high share of species of the alliance *Alno-Ulmion* and the class *Alnetea glutinosae* (18–9.8%), e.g.: *Ficaria verna, Gagea lutea* and *Festuca gigantea* was also noted in these plots. Frequently were also recorded plants characteristic of moist forest edges from ordo *Glechometalia* (10.3% of the total flora), e.g.: *Glechoma hederacea, Geum urbanum* and *Geranium robertianum*. Only two species characteristic of oak-hornbeam forest (alliance *Carpinion betuli*) were noted with high constancy. They are: *Stelaria holostea* and *Galium schultesii*. A numerous group of all forest type species (23 – 12.5%) includes forest plants (e.g. *Maianthemum bifolium* and *Ajuga reptans*) and forest clearing species of a wide habitat amplitude. From among non-forest species the most numerous are meadow plants from the class *Molinio-Arrhenatheretea* (30 species – 16.3% of the total flora), especially taxa characteristic of moist habitats (ordo *Molinietalia*). The most frequently noted were: *Lysimachia nummularia*, *L. vulgaris*, *Ranunculus repens* and *Stachys palustris*. In local depressions (moats) dominate aquatic and rush plants (25 species – 13.6%), e.g.: *Phragmites australis, Galium palustre* and *Hottonia palustris*.

The share of synanthropic species is very low (11 taxa – 6.0% of the flora). They are noted sporadically and do not play an important role in the composition of plant communities. The most frequently noted are: *Galeopsis pubescens* and *Rumex obtusifolius*.

Analysis of ecological indicator values (17) showed a domination of taxa of high light requirements (light – 75 taxa, half-shadow – 44, half-shadow/light – 30) (Fig. 3), that is related to occurrence of a numerous meadow, aquatic, rush and forest-edge species. The humidity index showed the domination of plants of moist and wet habitats (75 taxa). A large percentage of species of moderately moist (51) and moderately moist /moist habitats (44) was also observed. Plants characteristic of dry and dry/moderately moist habitats are rare (11). Indices of trophy and soil reaction confirm the domination of plants characteristic of eutrophic (95) and meso-/eutrophic habitats (59) of neutral (77) and neutral/basic reaction (64).

Two species are strictly (*Epipactis helleborine*, *Hepatica nobilis*) and three – partially protected (*Frangula alnus*, *Asarum europaeum*, *Ribes nigrum*). Six species belong to the group of regionally endangered taxa (4). They are: *Corydalis cava*, *Lathraea squamaria* (category EN), *Corydalis solida*, *Isopyrum thalictroi-*

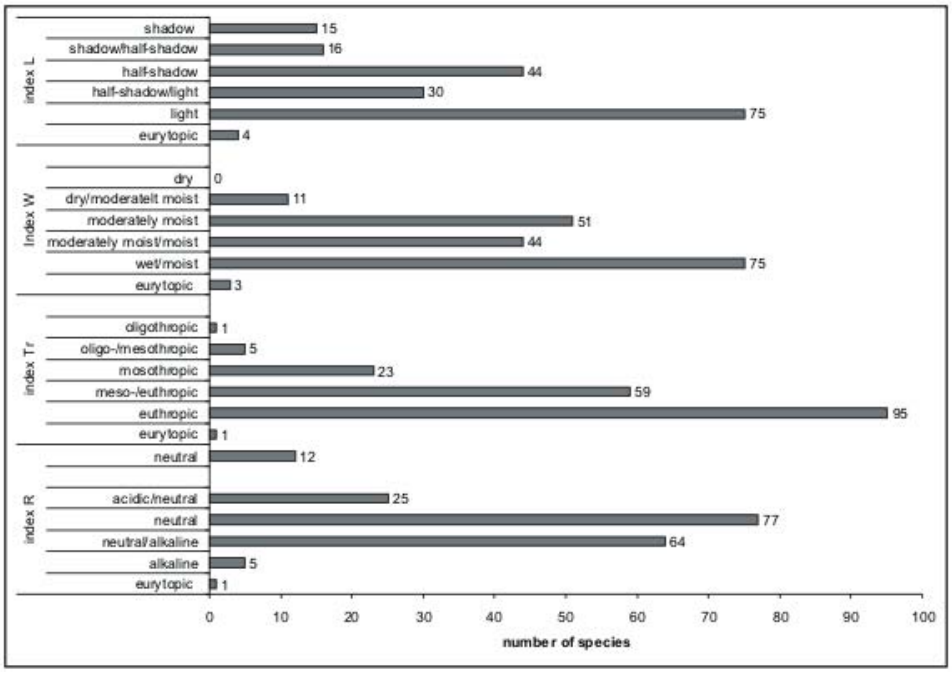

Fig. 3. Ecological characteristics of the flora of the "Dzięcioły" earthwork on the basis of ecological indicator values.

des, *Gagea minima* (category VU) and *Callitriche verna* (category LR). The mass occurrence of *Corydalis cava*, *C. solida*, *Hepatica nobilis* and *Isopyrum thalictroides* in herb layer is especially noteworthy.

DISCUSSION

The "Dzięcioły" earthwork belong to not numerous archaeological objects in this region, situated in the deciduous forest area (5). High natural values are related to occurrence of floristically rich communities of oak-hornbeam forests: *Tilio-Carpinetum typicum* and *T.-C. corydaletosum*, protected in the Directive on Nature 2000 (3). The communities are well preserved, characterized by typical structure and floristic composition. The share of synanthropic species is still very low (6.0%) and they all occur sporadically nearby the forest road. The floristic value of the object is increased by occurrence of 5 protected and 6 regionally endangered species (4). The mass occurrence of *Corydalis cava, C. solida* and *Isopyrum thalictroides*, as well as several individuals of *Ulmus minor* var. *suberosa*, considered regionally as rare (9) is also noteworthy. At the same time, it is one of the best preserved archeological objects in the region.

Due to a forest character of the earthwork no species considered to be the relicts of ancient cultivations were noted. Such plants were numerously recorded in the archeological objects in the Wielkopolska region (1, 2).

The occurrence of regionally extremely rare species – *Galanthus nivalis* – has not been confirmed during the last studies. A herbarium specimen from this area (*leg.* B. Wyczółkowska 1975) was deposited in Herbarium of UPH in Siedlce.

With regard to large archaeological and natural values, the "Dzięcioły" earthwork deserves legal protection similarly like the related object situated in the Sabnie commune (8). A complicated ownership land structure and problems related to purchase of plots from farmers cause a lot of difficulties. Establishment of the reserve would allow to introduce legislation preserving the existing water conditions.

CONCLUSIONS

1. The "Dzięcioły" earthwork is a valuable object with regard to both its natural and archaeological potential.
2. No species considered the relicts of ancient cultivations have survived till now.
3. A spatial protection of the area as a nature reserve was suggested due to protection of its value.

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