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European hazel community in the confines of the Turčianska kotlina Basin and adjacent mountain ranges

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Abstract: The article brings the numerical classification of the 27 original phytocoenological relevés of the European hazel stands from the boundary of the Turčianska kotlina Basin and adjacent mountain ranges (Kremnické vrchy Mts, Žiar Mts, Krivánska Malá Fatra Mts, Veľká Fatra Mts). Their comparison with original diagnoses of relevant syntaxa resulted to classification of all relevés within the association *Prenantho purpurei-Coryletum* (Kulczyński 1928) Kliment et Jarolímek 2012. The most important ecological factor determining floristical composition of the individual stands and consequently their classification is geological bedrock (andesite and marly limestone), which overshadow influence of the altitude.

Keywords: *Corylus avellana*, mesophilous shrub vegetation, *Corylo-Populion tremulae*, phytosociology, Turiec region (Central Slovakia).

Introduction

Stands dominating by European hazel (*Corylus avellana*) represent interesting landscape element which contributes to the picturesqueness and biological diversity of the (sub)montane regions of Slovakia (cf. JURKO 1996). They grow in belts of various width along the field roads, on (abandoned) balks, in meadow-

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pasture complexes or locally large shrub belts on the forest margins of the broadleaved or secondary coniferous forests. Relatively frequently they form the fall-line stands in the abandoned deep hollow ways or in the former boundaries of parcels. European hazel shrubs represent substitutive communities after the oak-hornbeam and beech forests and species pool of the original forests is markedly reflected in their floristic composition. They are preserved mainly in regions with the extensive farming and scattered settlement (VALACHOVIČ 2002); in the intensive cultivated agricultural land they were eliminated. In the Turiec region they are found in the periphery of basin, prevailingly on foots of slopes of the surrounding mountains. The most frequent and largest stands are preserved on foothills of the Kremnické vrchy Mts (surrounding of the villages Horná Štubňa and Turček) and adjacent low and flat ridge of the Žiar Mts (surrounding of the village Sklené) in region with former German settlement. From the Turiec region only several phytocoenological relevés were published till now. JURKO (1964) published from the surrounding of the village Horná Štubňa and Dolný Turček two relevés of the association *Lonicero (nigrae)-Coryletum* (Tab. 5, rel. 13, 21), from the surrounding of the village Sklabiňa one relevé of the association *Pruno spinosae-Coryletum* (Tab. 4, rel. 16). KLIMENT & JAROLÍMEK (2011) published three relevés of the association *Prenantho purpurei-Coryletum* (syn. *Lonicero nigrae-Coryletum*) from the surrounding of the villages Čremošné and Turčianske Jaseno (Tab. 1, rel. 1–3). This insufficient information were supplied in the vegetation period 2011 by relevés from localities with higher concentration of the hazel stands in the marginal parts of the Krivánska and Veľká Fatra Mts, Kremnické vrchy Mts, and Žiar Mts. The syntaxonomical classification of recent relevés we bring in this article.

Material and methods

The original unpublished phytocoenological relevés (27), made during the vegetation period 2011 by the Zürich-Montpellier school methods (BRAUN-BLANQUET 1951; WESTHOFF & van der MAAREL 1978), were compared with the original diagnoses of the formerly described associations (Jurko 1964, Tab. 4, 5). The relevés were done in the older and enough large stands without the recent anthropo-zoogenic disturbances (cutting, cow punching, shepherd). Analysed relevés were proportional to shape and size of the stands. The size of relevés was minimally 80 m^2 [(80) 90–105, prevailingly 100 m^2] and their width in the linear stands reached at least 5 m. Relevés were situated into the central part of stands without overlap to the marginal parts of stands containing species from adjacent fringes, meadows and pastures. Before synthesis, the relevés were stored in the database TURBOVEG (HENNEKENS & SCHAMINÉE 2001) and transformed to the nine-degree ordinal scale (VAN DER MAAREL 1979). The relevés were modified in the program FYTOPACK (JAROLÍMEK & SCHLOSSER 1997). In this program, also the final phytocoenological table was arranged. Here and there, in analysed stands the species *Galeobdolon luteum* and *G. montanum* occur together in the vegetative phenophase and assessment of their cover separately was doubtful, therefore they were merged to *Galeobdolon luteum* s. l.

Prepared data were classified by program HierClus from the program package SYN-TAX 2000 (PODANI 2001), using Ružička's and Jaccard's coefficients of similarity and β-flexible method of clustering with coefficient β = -0.25.

In the phytocoenological table (Tab. 1) the following abbreviations were used for the designation of species to the higher syntaxa: ai = *Alnion incanae*, aq = *Aceri tatarici-Quercion*, as = *Arctio-Sambucion nigrae*, cb = *Carpinion betuli*, cp = *Corylo-Populion tremulae*, Fs = *Fagetalia sylvaticae*, fs = *Fagion sylvaticae*, QF = *Querco-Fagetea*, Qp = *Quercetalia pubescenti-petraeae*, qp = *Quercion petraeae*, RP = *Rhamno-Prunetea*, ss = *Sambuco-Salicion capreae*, ta = *Tilio-Acerion*, TG = *Trifolio-Geranietea*, tm = *Trifolion medii*. The more fine values of the degree 2 were used (2m, 2a, 2b; cf. Barkman et al. 1964) in shorted form m, a, b. With regard to woody character of analysed community, the first in the table (Tab. 1) are tree and shrub layers followed by the data on herb and moss layers. Frequency of every species (in %) is supplied by the upper index with the mean cover in nine-degree scale.

The differential species were stated based on the comparison of species composition of the analysed community (Tab. 1, column A) with the original diagnosis of the association *Pruno-Coryletum* (Tab. 1, column B) and with regard to results of partial synthesis of the West Carpathian hazel shrubs (KLIMENT & JAROLÍMEK 2011, Tab. 2); in the table (Tab. 1) the data on their frequency together with the differential species of variants are bolded. In the column B, the data on woody species in the herb layer usually absent, in harmony with relevés published by JURKO (1964). Setting of diagnostic taxa of the higher units follows MORAVEC et al. (2000) and JAROLÍMEK et al. (2008a). In the table (Tab. 1) they are marked by above mentioned abbreviations in the first column. All taxa with frequency above 60 % were considered as constant.

Nomenclature of vascular plants and mosses follows Checklist of non-vascular and vascular plants of Slovakia (MARHOLD et al. 1998; KUBINSKÁ & JANOVICOVÁ 1998); asterisk (*) in phytocoenological table substitutes the species name within the subspecies name. Nomenclature of syntaxa and ordering of the association to the higher units is in accordance with JAROLÍMEK et al. (2008b). In the synonymy of the association *Prenantho purpurei-Coryletum* the article of the International Code of the Phytocoenological Nomenclature (ICPN; WEBER et al. 2000), elucidating the reason of rejecting of the name *Lonicero nigrae-Coryletum* is stated.

Altitudes and local names of the localities follow tourist maps of the Kremnické vrchy (2001), Národný park Malá Fatra (2002), and Veľká Fatra (2006). For localization of relevés, geographical coordinate system WGS-84 was used.

Results and discussion

Phytocoenological relevés from the Turiec region were numerically classified and compared with the original diagnoses of the West Carpathian hazel shrubs (JURKO 1964, Tab. 4, 5). Results of the comparison (dendrograms) show, that in spite of transition character of part of the relevés they all belong to the association *Prenantho purpurei-Coryletum* (Kulczyński 1928) Kliment et

Jarolímek 2012 [syn. *Lonicero nigrae-Coryletum* (Kulczyński 1928) Jurko 1964 nom. inval., Art. 3f of ICPN] (Tab. 1).

Differential taxa (against *Pruno spinosae-Coryletum*): *Acer pseudoplatanus* E_3, E_2, E_1, *Fagus sylvatica* E_2, E_1, *Fraxinus excelsior* E_2, E_1, *Padus avium* E_2, E_1, *Sambucus nigra* E_2, E_1, *Sorbus aucuparia* E_2, E_1, *Viburnum opulus* E_2, E_1, *Ribes uva-crispa* E_1, *Actaea spicata*, *Ajuga reptans*, *Anthriscus sylvestris*, *Astrantia major*, *Campanula persicifolia*, *Chaerophyllum aromaticum*, *Cruciata glabra*, *Dentaria bulbifera*, *Dryopteris filix-mas*, *Galeobdolon luteum* s. l., *Galium odoratum*, *Luzula luzuloides*, *Maianthemum bifolium*, *Melampyrum nemorosum*, *Mercurialis perennis*, *Oxalis acetosella*, *Paris quadrifolia*, *Phyteuma spicatum*, *Polygonatum verticillatum*, *Ranunculus lanuginosus*, *Rubus idaeus*, *Senecio ovatus*

Constant taxa: *Corylus avellana* E_2 (dom.), E_1, *Crataegus laevigata* E_2, *C. monogyna* E_1, *Ribes uva-crispa* E_1, *Swida sanguinea* E_1, *Viburnum opulus* E_1, *Aegopodium podagraria*, *Asarum europaeum*, *Fragaria vesca*, *Galeobdolon luteum* s. l., *Galium schultesii*, *Geum urbanum*, *Mercurialis perennis*, *Polygonatum multiflorum*, *Pulmonaria obscura*.

Analysed stands represent medium rich to very rich in species (31–90, at average 53 taxa) shrub community with dominating European hazel (*Corylus avellana*), reaching the height 4–5 m, in the older stands up to 7 (8) m. European hazel usually grows in groups; in the older stands the cover of canopy of shrubs decreases and varies between 90–98 % (the most frequently 95 %). In the marginal or less dense parts of stands some other shrubs can grow, such as *Crataegus laevigata*, *C. monogyna*, *Ligustrum vulgare*, *Lonicera xylosteum*, *Prunus spinosa*, *Sambucus nigra*, *Swida sanguinea*, *Viburnum lantana*, *V. opulus*, in the ground layer particularly *Ribes uva-crispa*. The presence of trees (*Acer campestre*, *A. pseudoplatanus*, *Fagus sylvatica*, *Padus avium*, etc.) is the characteristic feature of the stands. They can tower above the shrubs up to height 8–12 (15), rarely to 20–22 m, but usually they do not exceed level of shrubs. The most frequent they are in the herb layer E_1. The cover of the herb layer varies depending to the age of the stands, distribution pattern of the dominant species and the intensity of shading in the interval (20) 30–80 %, at average 50 %. Two or three herb sub-layers can be distinguished. The herbs are of height 30–50 cm, in stands with high herbs up to 130 cm. Numerous species from the order *Fagetalia* (Tab. 1) indicate the developmental relation to the mountain beech forests. Some of these species, such as *Actaea spicata*, *Dentaria bulbifera*, *Dryopteris filix-mas*, *Galeobdolon luteum* s. l., *Galium odoratum*, *Mercurialis perennis*, *Paris quadrifolia*, *Polygonatum verticillatum*, *Ranunculus lanuginosus*, and *Senecio ovatus* differ the association *Prenantho-Coryletum* against the hilly stands of the association *Pruno-Coryletum*. Presence of the mosses depends on the amount of skeleton on the surface. More frequent are species *Hypnum cupressiforme*, *Brachythecium populeum*, *B. velutinum*, *B. salebrosum*, *Plagiomnium cuspidatum*, and *P. affine*. In spite of low cover of the moss layer, the species diversity of mosses is relatively high. The number of species varies between 2–9; rarely (rel. 19) 12 moss species were found.

Stands of the association *Prenantho-Coryletum* in the Turiec region occur on the slopes with medium inclination [(5) 15–25 (45)°] and various orientation in the altitudes ca (420) 490–780 m. They usually form belts along the field roads, at abandoned balks, grassy slopes, at margins of ravines. At the forest mantles or at deforested corridors for high voltage electric lines they can cover larger contiguous plots. Loamy to sandy-loamy, fresh to medium moist, well aerated or compact soils are usually slightly skeletal (with rocks, rarely gravel). The skeleton (andesite, marl limestone, rarely granodiorite) covers only 2–5 (10) %, rarely up to 30 (50) % of the surface of the analysed plots. Some stands are without skeleton. The skeleton in some stands is of allochthonous origin – it was probably moved in past from the surrounding paddocks. On the soil surface a pieces of branch-wood, sprigs of hazel and other woods with fallen leaves and detritus decompose.

Independently from using of the above mentioned coefficients of similarity we obtained nearly identical (in the main dividing identical) result (Fig. 1), which reflects primarily the geological bedrock (andesite vs. limestone) and properties of relevant soils. This result facilitates dividing of the community to two regional well differentiated variants.

The stands at andesite bedrock (Tab. 1, block A1) consist of a mix of shade tolerant and light demanding species employing a changing light conditions within the phytocoenose, with various demands to soil moisture. Some diagnostic species of the association are more markedly connected with this variant (herbs *Dentaria bulbifera*, *Rubus idaeus*, *Luzula luzuloides*, *Cruciata glabra*, *Senecio ovatus* and woods *Acer pseudoplatanus*, *Sorbus aucuparia*). Species composition in the surroundings of the Dolný Turček is enriched by several mountain (sub)species, such as *Polygonatum verticillatum*, *Knautia maxima*, *Petasites albus*, *Veratrum *lobelianum*, rarely also *Lonicera nigra*, *Ribes alpinum*, *Aruncus vulgaris*, *Thalictrum aquilegiifolium*, and *Vaccinium myrtillus*. This variant is differentiated also by mosses *Brachythecium populeum* and *Atrichum undulatum*. The variant name-giving species, *Moehringia trinervia*, is medium shade tolerant and occurs at fresh moist, nutrient and bases (not calcium!) rich, loamy and sandy-loamy soils with well humus decomposition (MÁJOVSKÝ et al. 1965; KRIŽO et al. 1994).

Within this variant two groups of relevés are markedly differ. They reflect a history of analysed stands. Large stands in the surroundings of the village Dolný Turček are only sporadically disturbed by cutting of hazel shrubs (rel. 1–8). They occur mainly at slopes of the Pastiersky vrch Mt. (rel. 1–4, 8), species rich (56–90, in average 69 species per relevé). On the other hand, narrow belt stands in the meadow-pasture complex between the railway station and the village Horná Štubňa (rel. 9–13) are floristically poor [31–38 (57) species]. These stands are affected by nutrients from the surrounding intensified meadows and by cow punching (occurrence of *Galium aparine*, *Chelidonium majus*, *Cardamine impatiens*, penetrating of the *Urtica dioica* from nitrophilous fringes into the stands). Only one species rich stand (57 species) was found at the more steep higher part of slope at the abandoned pastures (rel. 10). In this region the mosaic

stands of hazel with other shrub species (*Prunus spinosa*, *P. padus*, *Crataegus laevigata*, *Sambucus nigra*, *S. racemosa*, etc.) are frequent.

The stands on marl limestone (Tab. 1, block A2) are differed against the foregoing variant by a mixture of mesophilous, nutrient demanding species (*Campanula trachelium*, *Glechoma hirsuta*, *Actaea spicata*, *Ranunculus lanuginosus*, *Sanicula europaea*, *Stachys sylvatica*, *Salvia glutinosa*) and relatively more thermophilous species with the main distribution in the lower altitude (*Acer campestre*, *Carpinus betulus*, *Viburnum lantana*, *Ligustrum vulgare*, *Euonymus europaea*, *Vincetoxicum hirundinaria*). Presence of the second group of species indicates the relationship to the association *Pruno-Coryletum* (cf. JURKO 1964, Tab. 5; KLIMENT & JAROLÍMEK 2011, Tab. 2). Among the mosses in this variant were registered only species *Pseudoleskeella nervosa* and *Plagiomnium undulatum*. Relevés are relatively equal in the number of species [39–54 (69) species per relevé]. This variant was named according to semi-shade loving species *Ranunculus lanuginosus*, which indicates fresh moist, nutrient and calcium rich, loamy humus soils (RANDUŠKA 1972; KRIŽO et al. 1994).

In some places species poor, on the level of variant hardly classifiable stands were found. An example is following relevé:

Relevé 28: Kriváska Malá Fatra Mts, village Turčianske Kľačany, ridge between the Kľačiansky potok Brook and brook Kúdeľ, stand of the old European hazel in the lower part of the steep high balk, hazel in groups with branches bent down the slope; soil surface stepped, soil compressed with numerous fragments of branches, in lower part with numerous loosely lying stones (granodiorite); 49°07´21,6˝ n. l., 18°57´47,1˝ e. l., ± 8 m; 512 m, S (180 °), inclination 10–20 °, plot 10 × 10 m, cover E_3 10 %, E_2 98 %, E_1 10 %, E_0 1 %, height E_3 10–12 m, E_2 5–6 m; 14. 7. 2011, Ján Kliment (jkl1829)

E_3: *Betula pendula* 1, *Populus tremula* 1, *Salix caprea* 1
E_2: *Corylus avellana* 5, *Crataegus monogyna* 2a, *Populus tremula* +
E_1: *Corylus avellana* +, *Crataegus monogyna* +, *Sambucus nigra* +
Aegopodium podagraria 2a, *Asarum europaeum* 1, *Campanula patula* +, *Geum urbanum* +, *Poa nemoralis* +, *Polygonatum multiflorum* +, *Rubus hirtus* agg. +
E_0: *Brachythecium populeum* +, *B. velutinum* +.

In the older stands the hazel shrubs attain a longer mutual distance (several metres), their branches are 10 (13) cm in diameter and 6–8 m of the height. Such freely walk-through stands, especially if they are situated on relatively flat slightly inclined slopes, live stock use during the summer heat as shelter against the sun. Therefore at the end of summer their herb layer uses to be hardly destroyed. The herb layer can be damaged also by live stock moving in belt stands at balks between extensively used pastures.

JURKO (1964) characterised the association *Lonicero nigrae-Coryletum* like a community of the humid montane areas without dependence at the geological background. This opinion was confirmed also by our observations. At the same time emerged that in the Turiec region properties of substratum strongly influence the floristic composition of montane hazel shrubs. The soil properties even suppress a complex influence of altitude, which came more evident in differentiation of hazel stands occupying the same geological background, e. g.

marl limestone (cf. KLIMENT & JAROLÍMEK 2011, Tab. 1). Relatively undisturbed development without the anthropo-zoogenic influences supports the optimal species diversity, structure and age of hazel stands.

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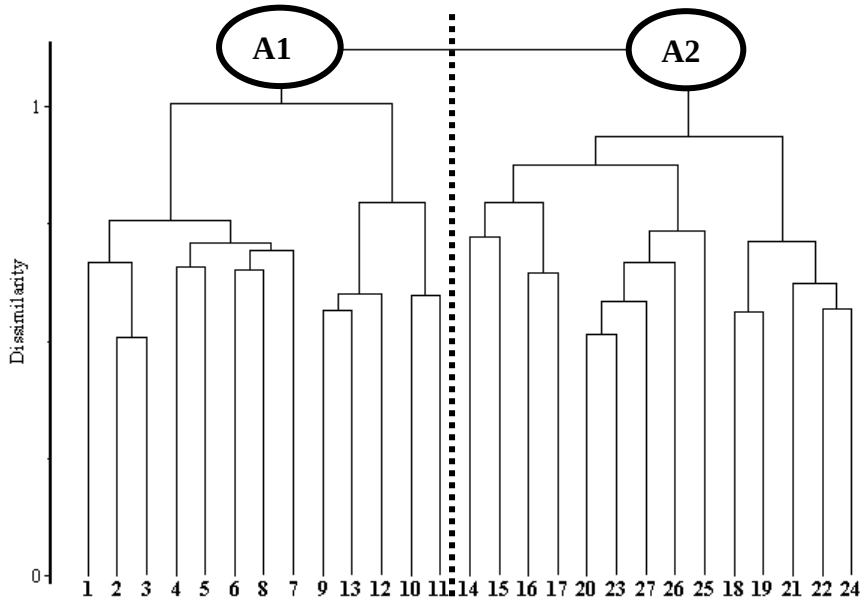

Fig. 1. *Prenantho purpurei-Coryletum* – cluster analysis of relevés from the Turiec region. A1 – variant with *Moehringia trinervia*, A2 – variant with *Ranunculus lanuginosus*.
(SYN-TAX 2000, Hierclus, β-flexible clustering (β = -0.25), Jaccard's coefficient of dissimilarity).

Fig. 2. European hazel stands in the Turiec region country (Foto K. Ujházy).

Fig. 3. Interior of the European hazel stand (relevé No. 2 in Tab. 1) (Foto K. Ujházy).

Tab. 1. Association *Prenantho purpurei-Coryletum* in the Turiec region
A – *Prenantho purpurei-Coryletum*, A1 – variant with *Moehringia trinervia*, A2 – variant with *Ranunculus lanuginosus*, B – *Pruno spinosae-Coryletum* (JURKO 1964)

		A1		A2		A	B
	Relevé No.	1111 1234756893201		11222112112222 45567671890234			
	Number of taxa	7985655633353 6098065915877	C_{A1} %	44453555464444 39309214995776	C_{A2} %	C_A %	C_B %
	Tree layer						
ta	*Acer pseudoplatanus*	...1.1.....1	23^3	.....a.....	7^5	**15^4**	-
cb	*Cerasus avium*	1.....	8^3	..b....11.....	21^4	15^4	-
ss	*Salix caprea*	.....a.....1.	15^4	.....1.....	7^3	11^4	-
Qp, cb	*Acer campestre*	.....	-	.....aaa.....	**21^5**	11^5	-
cb	*Carpinus betulus*	.....	-	.a....1.....	**14^4**	7^4	-
	Shrub layer						
cp	*Corylus avellana*	55555555555545	100^9	555554555a4555	100^9	100^9	100^8
	Crataegus laevigata	+..ba11.b11a1	77^4	.1...1+++a..11	57^3	67^3	52^3
QF	*Lonicera xylosteum*	+.....1..1+1	38^3	..++1..a+11111	71^3	56^3	47^2
	Crataegus monogyna	1a+.a.....	31^4	1..a+.11..1a11	64^3	48^3	37^2
RP	*Swida sanguinea*	...+.+..+..aa	38^3	...11.1.11+1..	50^3	44^3	47^3
ai	*Padus avium*	11.1..1..b+..	46^3	++.a+.1.....	36^3	**41^3**	-
Fs	*Fagus sylvatica*	.+1111++.....	54^3	+.+.....1.	21^2	**37^3**	-
Qp, cb	*Acer campestre*	.....	-	....+311+a3a11	**71^4**	37^4	58^3
ai	*Viburnum opulus*	1..+..+..++1.	46^2	....+..1...1..	21^3	**33^2**	-
as	*Sambucus nigra*	....+...11a.1	38^3	.1...1a+.....	29^3	**33^3**	-
ta	*Acer pseudoplatanus*	++++.+..+.+..	54^2	....+.....	7^2	**30^2**	5^2
qp	*Viburnum lantana*	.....	-	...1...+a111.1.	**50^3**	26^3	32^3
	Sorbus aucuparia	a..+.+..+..+..	**38^3**	.....	-	**19^3**	-
RP, Qp	*Ligustrum vulgare*	.....1..	8^3	.....++1...+	**29^2**	19^2	47^3
	Picea abies	+...+1+.....	31^2	.....	-	15^2	-
cb	*Cerasus avium*	.....+.....	8^2	.....+1.+..	21^2	15^2	-
RP	*Prunus spinosa*	.....a.	8^5	...1.+.....1..	21^3	15^3	74^2
	Malus sylvestris	+++.....	23^2	.....	-	11^2	-
ta	*Tilia platyphyllos*	.++...+.....	**23^2**	.....	-	11^2	-
Fs	*Fraxinus excelsior*	.....	-	+...r....+....	21^2	**11^2**	-
ss	*Sambucus racemosa*	+.....1.	15^3	.....	-	7^2	-
cb	*Carpinus betulus*	.....	-	.1....+.....	**14^3**	7^3	32^3
RP, aq	*Euonymus europaeus*	.....	-	...a..1.....	**14^4**	7^4	16^2
	Differential taxa of association						
Fs	*Mercurialis perennis*	11.1.+++1.11+	77^3	....a3ab4111aa	71^5	**74^4**	16^4
Fs	*Galeobdolon luteum*	bba..1a1bb1..	69^5	.b.aab1.a1.b1a	71^5	**70^5**	5^3
ai	*Viburnum opulus*	+1r1++++....+	69^2	1.r++r.1.+.1++	71^2	**70^2**	5^2
ta	*Ribes uva-crispa*	+++1++.+++111	92^2	.....1+..+1+1	43^3	**67^2**	5^2
	Anthriscus sylvestris	..+++...+++a1	62^3	++..rrr...+.++	57^2	**59^2**	5^2
	Sorbus aucuparia	++r++r+1.r.r.	**77^2**	r...r.....+++	36^2	**56^2**	-
	Ajuga reptans	++1.++++....+.	62^2	.+.+..+.+++..+	50^2	**56^2**	-
ta	*Acer pseudoplatanus*	+1+++1+.....	54^2	+.+++...r++.+.	57^2	**56^2**	-
Fs	*Fagus sylvatica*	..+++r.+.....	38^2	+1+.r.r+..++++	71^2	**56^2**	-
ai	*Padus avium*	11++.+++.1+..	69^2	++.1.r+.....	36^2	**52^2**	-
Fs	*Dryopteris filix-mas*	1+r.+..+r.+..	54^2	.++++..+..r.+.	50^2	**52^2**	11^2
Fs	*Galium odoratum*	.++1a..+..+..	46^3	.1.....1b3a33a	57^5	**52^4**	5^3
Qp, cb	*Campanula persicifolia*	.r+rrr.+.rr+.	**69^1**	.....+.+.+	21^2	**44^2**	5^2
Fs	*Paris quadrifolia*	1rr..+...1+..	46^2	....+..+r+..r+	43^2	**44^2**	5^2
	Maianthemum bifolium	+1.+.+.+.....	38^2	.+.....+++..++	43^2	**41^2**	5^2
as	*Sambucus nigra*	...r...++++.+	46^2	++...11+.....	36^2	**41^2**	-
Fs	*Dentaria bulbifera*	+11.+11+.++++	85^2	.....	-	**41^2**	-
ta, fs	*Actaea spicata*	.rr.....	15^1	..+++..1..++++	**57^2**	**37^2**	-
	Rubus idaeus	++..1+++...++	**62^2**	.....+..	7^2	**33^2**	5^5
	Chaerophyllum aromaticum	..+.+.r.....r	31^2	1+...+...++...	36^2	**33^2**	5^2
	Cruciata glabra	.++++.++.....	**46^2**	.....++...	14^2	**30^2**	5^2

Tab. 1. – cont.

		A1		A2			
	Relevé No.	1111		11222112112222			
		1234756893201		45567671890234			
	Number of taxa	7985655633353	C_{A1}	44453555464444	C_{A2}	C_A	C_B
		6098065915877	%	39309214995776	%	%	%
Fs	*Ranunculus lanuginosus*	. . +.	8^2	. . ++. . +. . +r . ++	**50^2**	**30^2**	-
	Astrantia major	r ++. . r . 1.	38^2	. . . +. +. . +.	21^2	**30^2**	5^3
cb, tm	*Melampyrum nemorosum*	r . +. . . +.	23^2	+. . . . . r +r . . r	36^1	**30^2**	-
Fs	*Fraxinus excelsior*	. r +. . . . r	23^1	+. r r . . . . . +. . . .	29^2	**26^1**	-
	Oxalis acetosella	+. . . . . b.	15^4	. 1+++. . . . . b.	36^3	**26^3**	-
	Luzula luzuloides	. ++. . +++. +. +.	**54^2**	. . . . .	-	**26^2**	-
Fs	*Senecio ovatus*	. r r ++. . 1. . . . +	**46^2**	. . +.	7^2	**26^2**	-
	Phyteuma spicatum	++r . . +.	**31^2**	. . . . . +. .	7^2	**19^2**	-
fs	*Polygonatum verticillatum*	+. . . . +. +. . +. .	**31^2**	. . . . . +.	7^2	**19^2**	-
	Differential taxa of the variants						
Fs	*Moehringia trinervia*	. +++. . . . +++. .	**46^2**	. . . . .	-	**22^2**	-
	Primula veris	. . +++r +. . . . r .	**46^2**	. . . . .	-	22^2	-
	Carex montana	. r r . ++1+.	**46^2**	. . . . . +. . . .	7^2	26^2	-
	Fragaria moschata	+r ++. ++.	**46^2**	+.	7^2	26^2	-
Fs	*Symphytum tuberosum*	+11. . 1. . +. . . .	**38^3**	. +.	7^2	22^3	11^4
	Ranunculus acris	. r r . . . r r . . . r .	**38^1**	. . . . .	-	19^1	-
Qp, cb	*Convallaria majalis*	+r +. . +. +.	**38^2**	. . . . .	-	19^2	-
	Cardamine pratensis	++++. . . r	**38^2**	. . . . .	-	19^2	-
ta	*Tilia platyphyllos*	. +r . . r ++.	**38^2**	. . . . .	-	19^2	-
Fs	*Scrophularia nodosa*	. . . . r . r r . . . r r	**38^1**	. +.	7^2	22^1	5^2
Fs	*Cardamine impatiens*	. . . r . . . . ++. ++	**38^2**	. . . . .	-	19^2	-
	Galium aparine	. . . . . r ++++	**38^2**	. . . . .	-	19^2	37^4
	Knautia maxima	r r r . . . . +.	**31^1**	. . . . .	-	15^1	-
	Solidago virgaurea	+r . . . r . r	**31^1**	. . . . .	-	15^1	-
	Petasites albus	+++.	**23^2**	. . . . .	-	11^2	-
	*Veratrum *lobelianum*	+a. . . . . +.	**23^3**	. . . . .	-	11^3	-
	Brachythecium populeum (E_0)	. ++++. +. . . b3+	**62^3**	. . . . . ++. . . . . +	21^2	41^3	-
	Atrichum undulatum (E_0)	. . +. . . +. ++. . .	**31^2**	+.	7^2	19^2	-
Qp, cb	*Acer campestre*	. . . . .	-	. +. ++++++1++++	**86^2**	44^2	-
Fs	*Campanula trachelium*	. r +. +.	23^2	+. +1+++. . +++++	**79^2**	52^2	42^2
Fs	*Glechoma hirsuta*	. +.	8^2	. . +. . ++++. r 1++	**64^2**	37^2	26^2#
RP, Qp	*Ligustrum vulgare*	. . . . . ++	15^2	. . +. . . . +++. +. 1	**43^2**	30^2	-
qp	*Viburnum lantana*	. . . +.	8^2	. . . r r . r +. r . . . +	**43^1**	26^1	-
Fs	*Sanicula europaea*	. . . . .	-	. . . . . ++1. ++1	**43^2**	22^2	11^3
QF	*Bromus benekenii*	. . r	8^1	. . . . . +11. +. +	**36^2**	22^2	-
Qp, TG	*Vincetoxicum hirundinaria*	. . . . .	-	. . +. r . . . . ++. . .	**29^2**	15^2	-
ai	*Stachys sylvatica*	. . . . .	-	. . . r . +. . . +. . . +	**29^2**	15^2	-
	Salvia glutinosa	. . . . .	-	. . b+. . +.	**21^3**	11^3	21^2
QF	*Brachypodium sylvaticum*	. . . . .	-	. . . 1. +. . +.	**21^2**	11^2	16^2
RP, aq	*Euonymus europaeus*	. . . . .	-	. . . +. . +. . . +. . .	**21^2**	11^2	5^2
Fs	*Lilium martagon*	. . . . .	-	. . . . . +. . . . r . r .	**21^1**	11^1	-
cb	*Carpinus betulus*	. . . . .	-	++.	**14^2**	7^2	-
	Pseudoleskeella nervosa (E_0)	. . . . .	-	. . . . . +++. . +. +	**36^2**	19^2	-
	Plagiomnium undulatum (E_0)	. . . . .	-	+. . +. . . . . +. . . .	**21^2**	11^2	-
	Rhamno-Prunetea						
cp	*Corylus avellana*	+++++. +++++++	92^2	+++++++++++++.	93^2	93^2	-
	Swida sanguinea	. r r +++. . +. . 1+	62^2	r . +++++++++1++	93^2	78^2	-
	Prunus spinosa	. . . . +. . . ++. ++	38^2	+. . 1. +. +. +. +. .	43^2	41^2	-
	Rhamnus catharticus	. . . . . +. r	15^2	. . . . . r . . .	7^1	11^1	-
ss	*Rubus hirtus* s. l.	. . . 1. . . . . r .	15^2	. . r	7^1	11^2	-
	Fagetalia sylvaticae						
	Asarum europaeum	+abb3a1a+11ab	100^4	. a. 3aaa1+bab1a	86^5	93^5	58^4
	Pulmonaria obscura	+r +a1. . . +++. .	62^2	+++1++1+++1a1+	100^3	81^2	32^3#
	Polygonatum multiflorum	++++++. . +1+. .	69^2	1+r +1+++. ++. +1	86^2	78^2	21^2

Tab. 1. – cont.

		A1		A2		A	B
	Relevé No.	1111		11222112112222			
		1234756893201		45567671890234			
	Number of taxa	7985655633353	C_{A1}	44453555464444	C_{A2}	C_A	C_B
		6098065915877	%	39309214995776	%	%	%
	Aegopodium podagraria	1bbr1.++3aa+a	92^4	...b1+ba+...a.	50^4	70^4	42^3
cb	*Galium schultesii*	+1+ab+a1..+++	85^3	+1..+...+11...	43^3	63^3	11^2
	Viola reichenbachiana	.++1++.+.....	46^2	.....++1++1+	50^2	48^2	42^2
	Geranium robertianum	...+.+.+1..b.	38^3	.++..1++...+..	43^2	41^3	58^4
cb	*Cerasus avium*	.+rrrr.....	38^1	..++r....r.++.	43^2	41^1	-
	Mycelis muralis	.++.r.++..++.	54^2	.+1.....r.....	21^2	37^2	11^2
	Epilobium montanum	..r...rr...r+	38^1	.+.........+..	14^2	26^1	5^2
	Carex digitata	r.....++.....	23^2	...+..........	7^2	15^2	5^2
ta	*Acer platanoides*	.r+....r.....	23^1	.....	-	11^1	-
	Myosotis sylvatica	.......+...++	23^2	.....	-	11^2	-
	Querco-Fagetea						
	Melica nutans	+++..+1...+..	46^2	+.....+++++++...	57^2	52^2	26^3
	Lonicera xylosteum	++.+...+..+..	38^2	...+.+.1+++aa1	64^3	52^3	-
Qp	*Brachypodium pinnatum*	.+r.a.+.....	31^3	.....1.....+	14^3	22^3	11^4
qp	*Viola riviniana*	++++.+.....	38^2	.....	-	19^2	-
	Other taxa						
	Geum urbanum	.+++++++++.r+	85^2	1+..r+++++r++.	79^2	81^2	58^3
	Poa nemoralis	+++1++.++++11	92^2	++.......+.1.+	36^2	63^2	63^2
	Crataegus monogyna	r++.r.....	31^2	++r++++++++.++	93^2	63^2	-
	Fragaria vesca	.+.1a11+....+	54^3	++++.+..+1+1+.	71^2	63^2	42^3
	Heracleum sphondylium	.r+...r....rr	38^1	rrr+r++..+r.r.	71^1	56^1	32^2
	Urtica dioica	++++r.++1.+1a	85^2	+....1++...+..	36^2	59^2	42^3
	Crataegus laevigata	.+.+.+++++...	54^2	.........++....	14^2	33^2	-
	Dactylis glomerata	..r.+..+..++.	38^2	++..........	14^2	26^2	42^2
	Rosa canina	+.r.....r.r.	31^1	.rr.....r...	21^1	26^1	-
	Ranunculus auricomus agg.	+++..r.r+....	46^2	.....	-	22^2	-
	Veronica chamaedrys	..+...+r...+.	31^2	+.........+....	14^2	22^2	16^2
	Hieracium murorum	+r.+...+.....	31^2	..+.....	7^2	19^2	5^2
	Carex muricata	..r+.........r	23^1	.....r+.....	14^2	19^1	-
	Lysimachia nummularia	..+++.....	23^2	b..+.....	14^4	19^3	21^2
	Rosa pendulina	+..r.....	15^2	.....r.rr....	21^1	19^1	5^2
	Campanula rapunculoides	..r+r.....	23^1	.+.....	7^2	15^2	-
	Ranunculus repens	..r....r...r.	23^1	r.....	7^1	15^1	-
	Lamium maculatum	..+.....	8^2	.....+.....+.1	21^2	15^2	5^2
	Alliaria petiolata	.....+.	8^2	.+...++.....	21^2	15^2	5^2
	Adoxa moschatellina	r1r.....	23^2	.....	-	11^2	-
	Chelidonium majus	.r.....+.1.	23^2	.....	-	11^2	-
	Populus tremula	....r+...+...	23^2	.....	-	11^2	-
	Picea abies	+....+.....	15^2	..r.....	7^1	11^2	-
	Quercus petraea agg.	.r.....	8^1	rr.....	14^1	11^1	-
	Dryopteris carthusiana	.r.....+.	8^1	.+.....+.	14^2	11^2	-
	Taraxacum sp.	..+.....	8^2	.....rr....	14^1	11^1	-
	Epipactis helleborine	....r.....	8^1	.....rr..	14^1	11^1	
	Primula elatior	.....	-	...1+.....+	21^2	11^2	21^2
	Bryophytes						
	Hypnum cupressiforme	b.1a+.+..111+	69^3	.+++...+++..+.	50^2	59^3	-
	Brachythecium velutinum	.+...+++.....	31^2	.+.+....+.+.+.	36^2	33^2	-
	Brachythecium salebrosum	...+..++....+	31^2	...++.+.....	21^2	26^2	-
	Plagiomnium cuspidatum	+.+...+.....	23^2	.....+++....	21^2	22^2	-
	Plagiomnium affine	....+.++...+.	31^2	+....+.....	14^2	22^2	-
	Schistidium apocarpum	++1+.....	31^2	.....+.....	7^2	19^2	-
	Eurhynchium hians	.+.....	8^2	+.+++.....	29^2	19^2	-
	Camptothecium sericeum	.....+.....	8^2	.....+.+.+....	21^2	15^2	-
	Plagiothecium denticulatum	1.....	8^3	+.....+.	14^2	11^2	-

Tab. 1. – cont.

	A1		A2				
Relevé No.	1111		11222112112222				
	1234756893201		45567671890234				
Number of taxa	7985655633353	C_{A1}	44453555464444	C_{A2}	C_A	C_B	
	6098065915877	%	39309214995776	%	%	%	
Homalia trichomanoides	....+.....	8^2	..+.....+....	14^2	11^2	-	
Amblystegium serpens	......+.....	8^2	.....++.....	14^2	11^2	-	
Brachythecium rutabulum	.....+..+.	15^2	.+..........	7^2	11^2	-	
Bryum capillare	..........+.	8^2	..+.....+.....	14^2	11^2	-	
Number of accesoric taxa	111		1 1				
	5503743703181		26640245213534				

Taxa present in one or two relevés:

E_3: *Acer platanoides* 1 (2); *Betula pendula* + (7); *Fagus sylvatica* 2b (22); *Padus avium* 2a (13); *Picea abies* 1 (1); *Populus tremula* 2a (11); *Prunus insititia* 1 (10); *Tilia platyphyllos* 1 (3), 2a (16)

E_2: *Acer platanoides* + (1. 3); *Clematis vitalba* 1 (23, 24); *Crataegus curvisepala* 2a (16); *Frangula alnus* + (7); *Lonicera nigra* 1 (1); *Populus tremula* + (5, 15); *Prunus insititia* 1 (2), 2a (20); *Rhamnus catharticus* + (19); *Ribes alpinum* + (2, 4); *R. uva-crispa* 1 (17), + (24); *Rosa canina* + (3, 16); *Salix caprea* 1 (12, 26); *Sorbus aria* 1 (21); *Ulmus glabra* + (3)

E_1: *Abies alba* r (8); *Aconitum vulparia* + (23); *Alchemilla* sp. r (7); *Allium oleraceum* r (3); *Alnus incana* r (25, 26); *Anemone nemorosa* r (13), + (15); *Angelica sylvestris* r (1), + (14); *Aquilegia vulgaris* r (4); *Arctium* sp. r (10); *Aruncus vulgaris* 2a (1), + (2); *Astragalus glycyphyllos* r (7); *Athyrium filix-femina* + (1), r (2); *Campanula patula* r (10), + (15); *Carex pilosa* 1 (6); *C. sylvatica* 1 (17), + (26); *Clematis alpina* + (17, 18); *C. vitalba* + (24); *Clinopodium vulgare* + (22); *Colchicum autumnale* + (3); *Crepis biennis* r (10); *C. mollis* r (2); *Cystopteris fragilis* r (5); *Daphne mezereum* + (22), r (23); *Digitalis grandiflora* r (7); *Festuca gigantea* r (3), + (13); *Frangula alnus* r (2); *Galeopsis pubescens* + (14, 15); *Galeopsis* sp. r (1, 6); *Gymnocarpium dryopteris* 2b (1); *Hedera helix* 1 (19); *Hieracium lachenalii* + (2), r (4); *Hypericum maculatum* r (3); *Impatiens noli-tangere* + (15); *Isopyrum thalictroides* + (2); *Lapsana communis* r (15); *Laserpitium latifolium* r (2), + (7); *Lathyrus vernus* + (16); *Lonicera nigra* + (2, 8); *Malus sylvestris* r (3); *Neottia nidus-avis* r (7), + (19); *Pimpinella major* + (20); *Pleurospermum austriacum* r (8); *Poa angustifolia* r (3); *P. trivialis* + (10); *Prenanthes purpurea* r (5); *Prunus insititia* + (2, 20); *Pteridium aquilinum* r (17); *Pulmonaria officinalis* 1 (22), + (24); *Pyrethrum corymbosum* + (22); *Ribes alpinum* 1 (1), + (2); *Rubus caesius* 1 (26); *Sambucus racemosa* + (10); *Senecio germanicus* + (1, 25); *Stellaria media* + (10); *Thalictrum aquilegiifolium* r (1, 8); *Torilis japonica* r (16); *Turritis glabra* r (10); *Ulmus glabra* + (21); *Vaccinium myrtillus* + (1, 8); *Valeriana *sambucifolia* + (16); *Veronica officinalis* + (6); *Vicia cracca* r (7); *V. sepium* r (19)

E_0: *Anomodon attenuatus* + (16, 19); *A. longifolius* 1 (16), + (19); *A. viticulosus* + (16, 19); *Brachythecium reflexum* + (8); *Bryum subelegans* + (18); *Cirriphyllum crassineurium* + (16); *C. piliferum* + (2, 8); *C. tommasinii* + (16, 21); *Ctenidium molluscum* + (25, 26); *Encalypta streptocarpa* + (25); *Fissidens dubius* + (25); *Metzgeria furcata* + (19, 21); *Plagiothecium cavifolium* 1 (1); *P. nemorale* + (1); *Plagiochila porelloides* + (25); *Polytrichum formosum* + (1); *Porella platyphylla* + (19); *Pylaisia polyantha* + (19); *Rhizomnium punctatum* + (2, 5); *Tortella tortuosa* + (19, 21).

Explanations: # – JURKO (1964): *Glechoma hederacea* s. l., *Pulmonaria officinalis* agg.

Localities of relevés (Tab. 1)

Explanations: e. l. – east longitude, jkl – Ján Kliment, KF – Krivánska Fatra Mts, Kv – Kremnické vrchy Mts, n. l. – north latitude, VF – Veľká Fatra Mts, Ž – Žiar Mts, rel. – relevé, v. – village. The first locality contains detail description of the locality data.

1. Kv, v. Turček, part Dolný Turček, Pastiersky vrch Mt. (815,6 m), NW slope above the left side of the valley Toliarska (in direction of flow), ca 150 m NE from the railway track, young linear stand of hazel at relatively steep balk with stony to bouldery surface (ca 30 %, andesite); 48°45´57,2˝ n. l., 18°54´33,7˝ e. l., ± 5 m; 685 m, SZ (315 °), inclination 25 °, plot 16 × 6 m, cover E_3 5 %, E_2 95 %, E_1 50 %, E_0 25 %, height E_3 6 m, E_2 4 (5) m, E_1 130/50/15 cm; 22. 6. 2011, Karol Ujházy, Ján Kliment. (jkl1810)
2. Kv, v. Dolný Turček, older hazel stand above the rel. 1, uniform slope, near the upper margin with sporadic boulders (andesite), hazel in groups, soil brown, loamy with discontinuous layer of litterfall; 48°45´ 52,6˝ n. l., 18°54´33,7˝ e. l., ± 5 m; 700 m, N (355 °), 15 °, 1 0 × 10 m, E_3 3 %, E_2 90 %, E_1 75 %, E_0 1 %, E_3 8 m, E_2 do 7 m, E_1 70/30 cm; 22. 6. 2011, Karol Ujházy, Ján Kliment. (jkl1811)
3. Kv, v. Dolný Turček, Pastiersky vrch Mt., WSW slope above the village, large old hazel shrubs below the top of the ridge from the side limited by low stony bank, hazel in groups, boulders sporadically in the upper part of plot; 48°45´50,3˝ n. l., 18°54´31,9˝ e. l., ± 6 m; 720 m, WSW (250 °), 25 °, 10 × 10 m, E_3 5 %, E_2 95 %, E_1 60 %, E_0 5 %, E_3 22 m, E_2 7 (8) m; 22. 6. 2011, Karol Ujházy, Ján Kliment. (jkl1812)

4. Kv, v. Dolný Turček, south slope of the ridge between the Toliarska valley and valley of the river Turiec, shrubby hollow way below the top, stand of various age, on the soil surface litterfall, branches, locally also stones and boulders (ca 15 %, andesite); 48°46´07,5˝ n. l., 18°54´28,1˝ e. l., ± 6 m; 742 m, J (174 °), 5 °, 6 × 15 m, E_3 5 %, E_2 98 %, E_1 40 %, E_0 10 %, E_3 8 m, E_2 4–5 m, E_1 25–40 cm; 7. 7. 2011, Ján Kliment. (jkl1813)
5. Kv, v. Dolný Turček, wide contour-line hazel shrubs ca 150 m north from rel. 4, above the Totiarska valley, uniform slope, hazel in groups, skeleton (andesite) only sporadically; 48°46´10,9˝ n. l., 18°54´34,3˝ e. l., ± 9 m; 742 m, ENE (58 °), 15 °, 10 × 10 m, E_3 15 %, E_2 95 %, E_1 30 %, E_0 1 %, E_3 8 m, E_2 5 m; 7. 7. 2011, Ján Kliment. (jkl1814)
6. Kv, v. Dolný Turček, older contour-line hazel shrubs downward from rel. 5, soil surface slightly undulated with sporadic stones to boulders (andesite), hazel in groups; 48°46´07,6˝ n. l., 18°54´39,3˝ e. l., ± 7 m; 722 m, ESE (110 °), 25 °, 20 × 5 m, E_2 95 %, E_1 35 %, E_0 1 %, E_2 6 (7) m; 7. 7. 2011, Ján Kliment. (jkl1815)
7. Kv, v. Dolný Turček, south slope of the spot height 902,0 m above the valley Toliarska, hazel shrubs of various age above the contour-line forest road, gentle uniform slope with sporadic boulders (andesite); 48°46´ 24,2˝ n. l., 18°54´46,0˝ e. l., ± 7 m; 760 m, SSE (150 °), 15 °, 10 × 10 m, E_3 1 %, E_2 90 %, E_1 75 %, E_0 1 %, E_3 ca 10 m, E_2 5–6 (8) m; 7. 7. 2011, Ján Kliment. (jkl1816)
8. Kv, v. Dolný Turček, Pastiersky vrch Mt., large hazel shrubs on the NW slope above the valley Toliarska, partially influenced by former cutting, hazel in groups; 48°4 5´53,5˝ n. l., 18°54´43,3˝ e. l., ± 6 m; 747 m, N (356 °), 15 °, 12 × 8 m, E_2 95 %, E_1 40 %, E_0 2 %, E_2 4–5 m; 7. 7. 2011, Ján Kliment. (jkl1817)
9. Kv, v. Horná Štubňa, above the railway station, hazel shrubs of various age between mown meadows and abandoned field road, near the lower margin with nitrophilous fringe (*Urtica dioica*); soil brown, loamy-sandy, gravel, at surface coarse gravel, stones, sporadically boulders (ca 10 %, andesite); 48°47´45,4˝ n. l. , 18°53´02,8˝ e. l., ± 7 m; 642 m, WSW (245 °), 15 °, 20 × 5 m, E_2 98 %, E_1 50 %, E_0 1 %, E_2 4 m, E_1 65/40/25 cm; 8. 7. 2011, Ján Kliment (jkl1818)
10. Kv, v. Horná Štubňa, NNE from the railway station, fall-line stand of hazel shrubs on stony-boulders bedrock (50 %, andesite) with fine earth, soil (red)brown, gravel; 48°47´58,5˝ n. l., 18°53´04,4˝ e. l., ± 6 m ; 657 m, WNW (300 °), 15 °, 5 × 20 m, E_3 7 %, E_2 95 %, E_1 40 %, E_0 30 %, E_3 8 m, E_2 4 m; 8. 7. 2011, Ján Kliment. (jkl1819)
11. Kv, between the railway station and the v. Horná Štubňa, upper part of ridge below the power line, hazel stand at abandoned balk, hazel in bunches, at the soil surface sporadic boulders (andesite) and decomposed branches; 48°48´19,0˝ n. l., 18°53´24,6˝ e. l., ± 7 m; 673 m, NNW (330 °), 20 °, 12 × 7 m, E_3 10 %, E_2 95 %, E_1 40 %, E_0 1 %, E_3 8 m, E_2 4 m; 8. 7. 2011, Ján Kliment. (jkl1820)
12. Kv, v. Horná Štubňa, SSE from the village, contour-line stand of shrubs among mown meadows, at abandoned balk, surface with stones and boulders (ca 40 %, andesite); 48°48´30,3˝ n. l., 18°53´29,7˝ e. l., ± 8 m; 630 m, WNW (320 °), 25 °, 20 × 5 m, E_2 95 %, E_1 60 %, E_0 15 %, E_2 5 m, E_1 70/30 cm; 8. 7. 2011, Ján Kliment. (jkl1821)
13. Kv, v. Horná Štubňa, SSE from the village, down from power line, contour-line stand of shrubs at abandoned balk, surface locally convex, sparsely skeletal (ca 10 %, andesite); 48°48´40,6˝ n. l., 18°53´34,1˝ e. l., ± 9 m; 636 m, W (280 °), 10 (5–15) °, 20 × 5 m, E_3 10 %, E_2 95 %, E_1 40 %, E_0 6 %, E_3 7–8 m, E_2 4 (6) m; 8. 7. 2011, Ján Kliment. (jkl1822)
14. KF, v. Turčianske Kľačany, eastward from the upper end of the village, older hazel shrubs of various age below the power line, above the upper margin of former balk, surface uniform, without skeleton, sporadic fragments of hazel branches; 49°07´17,1˝ n. l., 18°57´45,9˝ e. l ., ± 5 m; 492 m, S (170 °), 10 °, 10 × 10 m, E_2 95 %, E_1 30 %, E_0 1 %, E_2 5–6 m; 14. 7. 2011, Ján Kliment (jkl1828)
15. KF, v. Turčianske Kľačany, ridge between the Kľačiansky potok Brook and brook Kúdeľ, old hazel shrubs near the west margin of forest enclave, above the shallow small walley, skeleton (granodiorite) only sporadic, here and there fragments of hazel branches; 49°07´21,7˝ n. l., 18°57´51,6˝ e. l., ± 6 m; 508 m, ESE (110 °) , 15 °, 12 × 8 m, E_3 10 %, E_2 95 %, E_1 30 %, E_0 1 %, E_3 18–20 m, E_2 do 8 m; 14. 7. 2011, Ján Kliment (jkl1830)
16. VF, v. Sklabinský Podzámok, north-westward from the village, foot of the Katova skala Mt. (927,4 m), contour-line hazel shrubs, surface locally stony (light limestone), hazel in groups; 49°03´13,5˝ n. l., 19°01´ 44,7˝ e. l., ± 8 m; 579 m, SW (230 °), 25 °, 12 × 8 m, E_3 25 %, E_2 90 %, E_1 70 %, E_0 2 %, E_3 10 m, E_2 5 m, E_1 100/45/20 cm; 17. 8. 2011, Ján Kliment (jkl1861)
17. VF, v. Sklabinský Podzámok, foot of the Katova skala Mt., large fall-line hazel shrubs above the upper margin of the village, above the shallow small side valley, soil surface in the upper part of the relevé stony to bouldery (ca 5 %, light limestone), sporadically with fragments of branches, inclination unequal; 49°03´38,9˝ n. l. , 19°01´53,5˝ e. l., ± 6 m; 565 m, SSW (150 °), 10 (5–15) °, 15 × 7 m, E_3 12 %, E_2 95 %, E_1 60 %, E_0 1 %, E_3 8 m, E_2 5 m, E_1 60/15–25 cm; 17. 8. 2011, Ján Kliment (jkl1862)
18. VF, v. ENE from the village, ridge between valleys of the Kantorský and Sklabinský Brook, hazel stand at the elevation SSE from the mast, stones (light limestone) and fragments of branches only sporadically; 49°02´49,9˝ n. l., 19°01´18,3˝ e. l., ± 9 m; 637 m, S (180 °), 15 °, 8 × 12 m, E_3 10 %, E_2 90 %, E_1 80 %, E_0 1 %, E_3 10 m, E_2 5 (6) m, E_1 25 cm; 17. 8. 2011, Ján Kliment (jkl1863)
19. VF, v. Sklabiňa, ENE from the village, ridge between valleys of the Kantorský and Sklabinský Brook, elevation on the top ca 200 m eastward from rel. 18, surface locally bouldery (light limestone), hazel in groups; 49°02´48,7˝ n. l., 19°01´25,2˝ e. l., ± 6 m; 641 m, SSW (200 °) , 25 °, 8 × 12 m, E_2 90 %, E_1 75 %, E_0 3 %, E_2 5 m, E_1 80/20 cm; 18. 8. 2011, Ján Kliment (jkl1864)

20. VF, v. Sklabinský Podzámok, east slope of the hill (565,7 m), south-westward from the village, above the crossroad of the field road and the state road, belt of the hazel shrubs near the meadows, hazel in bunches; soil dark-brown, crumby, at the surface with sporadic fragments of branches, without skeleton; 49°03´03,5˝ n. l., 19°00´59,4˝ e. l., ± 6 m; 560 m, ESE (105 °), 15 °, 10 × 8 m, E_2 95 %, E_1 25 %, E_0 1 %, E_2 5 (6) m, E_1 35/10 cm; 18. 8. 2011, Ján Kliment (jkl1865)
21. Ž, v. Sklené, westward from the upper margin of the village, older hazel shrubs near the field road (red mark) to the Horenovo Mt (892,2 m); soil red-brown, crumby, on the surface sporadic stones (light limestone), sparsely fragments of branches; 48°46´42,1˝ n. l., 18°47´59, 6˝ e. l., ± 7 m; 732 m, ENE (60 °), 20 °, 15 × 7 m, E_3 15 %, E_2 95 %, E_1 35 %, E_0 2 %, E_3 8 m, E_2 5 m, E_1 50/35/10 cm; 24. 8. 2011, Ján Kliment (jkl1871)
22. Ž, v. Sklené, contour-line hazel shrubs above the field road (red mark) to the Horenovo Mt; hazel in bunches, soil light-brown, crumby, skeleton (light limestone) sporadically; 48°46´54,6˝ n. l., 18°47´42,3˝ e. l., ± 8 m; 781 m, V (90 °), 15 °, 20 × 5 m, E_3 20 %, E_2 90 %, E_1 75 %, E_0 1 %, E_3 15 m, E_2 5 (6) m, E_1 90/50/15 cm; 24. 8. 2011, Ján Kliment (jkl1872)
23. Ž, v. Sklené, westward from the village, large hazel shrubs at ENE slope above the side small valley, skeleton (light limestone) sporadically, hazel in groups; 48°46´45,1˝ n. l., 18°47´58,2˝ e. l., ± 9 m; 724 m, E NE (60 °), 10 °, 10 × 10 m, E_2 90 %, E_1 70 %, E_0 1 %, E_2 5 m, E_1 30/10 cm; 24. 8. 2011, Ján Kliment (jkl1873)
24. Ž, v. Sklené, large mainly young hazel shrubs at ENE slope above the upper margin of the village, skeleton (limestone rocks and coarse gravel) only sporadically; 48°46´36,4˝ n. l., 18°43´15,1˝ e. l., ± 8 m; 69 1 m, ENE (60 °), 15 °, 10 × 10 m, E_2 95 %, E_1 55 %, E_0 1 %, E_2 4 (5) m, E_1 40/10 cm; 24. 8. 2011, Ján Kliment (jkl1874)
25. VF, v. Nolčovo, hill Hradisko (464,2 m) westward from the village, large old hazel shrubs at steep north oriented slope; soil compressed, significantly gravelly, at surface sporadically stones (light limestone), distance of hazel shrubs attains several meters, [diameter of branches 10 (13) cm]; 49°06´33,0˝ n. l., 19°04´01,7˝ e. l. , ± 12 m; 441 m, N (360 °), 45 °, 10 × 10 m, E_3 15 %, E_2 95 %, E_1 20 %, E_0 2 %, E_3 12 m, E_2 5–6 m, E_1 50/30/10 cm; 27. 8. 2011, Ján Kliment (jkl1876)
26. VF, v. Nolčovo, hill Hradisko, older hazel shrubs at the west foot, above the brook, skeleton sporadically, here and there fragments of hazel branches; 49°06´32,0˝ n. l., 19°03´55,3˝ e. l., ± 7 m; 420 m, W (280 °), 10 (15) °, 15 × 7 m, E_2 95 %, E_1 70 %, E_0 1 %, E_2 5–6 m; 27. 8. 2011, Ján Kliment (jkl1877)
27. VF, v. Podhradie, young hazel shrubs at the foot of hill, southward from the upper margin of the village, hazel in numerous bunches, here and there fragments of hazel branches, skeleton (light limestone) sporadically, soil locally gravelly; 49°05´12,7˝ n. l., 19°03´43,4˝ e. l., ± 6 m; 531 m, N (360 °), 15 °, 10 × 10 m, E_2 98 %, E_1 40 %, E_0 1 %, E_2 4 m, E_1 35 cm; 27. 8. 2011, Ján Kliment (jkl1878)

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