

XEROTHERMIC OAK FORESTS IN THE MIDDLE VÁH BASIN AND THE SOUTHERN PART OF THE STRÁŽOVSKÁ HORNATINA UPLAND, SLOVAKIA

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SUMMARY

The following associations of xerothermic oak forests were recognized in the Slovakian side of the Biele Karpaty Mts., the Čachtické Hills, the Povážsky Inovec Mts., and the Strážovská hornatina Upland:

- (1) *Pruno mahaleb-Quercetum pubescentis* Jakucs et Fekete 1957 — the most xerophilous and thermophilous open forests of southern slopes on limestones and dolomites of Pannonian phytogeographical region.
- (2) *Seslerio albicantis-Quercetum pubescentis* ass. nova — xerophilous and thermophilous open forests of southern slopes on limestones and dolomites in higher altitudes under influence of Carpathian phytogeographical region.
- (3) *Corno-Quercetum* Máthé et Kovács 1962 — moderately xerophilous and thermophilous forests on limestone and dolomite slopes occurring on less xerothermic habitats and in marginal areas of the Pannonian phytogeographical region.
- (4) *Festuco heterophyllae-Quercetum* Neuhäusl et Neuhäuslová-Novotná 1964 — moderately xerophilous and thermophilous forests on sunny slopes on poor crystalline rocks, representing a transition to oak-hornbeam forests.
- (5) *Potentillo albae-Quercetum* Libbert 1933 — moderately thermophilous forests of flat terrain on loamy substrata with changeable soil humidity regime.

INTRODUCTION

Phytosociological investigations of xerothermic oak forests were carried out in various areas of Slovakia (Nevole 1931, Dostál 1933, Klika 1937, 1938, Futák 1947, Michalko 1957, Jakucs 1961, Neuhäusl et Neuhäuslová-Novotná 1964, 1967, Neuhäuslová-Novotná et Neuhäusl 1965, Neuhäuslová-Novotná 1965, 1968, Šomšák et Háberová 1979 etc.). Extensive syntaxonomical literature on this topic originates from neighbouring Hungary (Zólyomi et Jakucs 1957, Jakucs et Fekete 1957, Jakucs 1961, Soó 1963 etc.). From the middle Váh basin and the southern part of the Strážovská hornatina Upland, phytosociological data on this vegetation were published by Klika (1937), Futák (1947), Jakucs (1961), and Maglocký (1979). However, syntaxonomy and actual distribution of the vegetation mentioned had remained unknown in this area. The present paper tries to overcome this gap.

METHODS

For the description of the vegetation, traditional methods of the Zürich-Montpellier school (Braun-Blanquet 1964, Westhoff et van der Maarel 1978) were used. Relevés were taken using a

7-grade scale of abundance and dominance (—,+,1,2,3,4,5). The classification of associations is based on the table synthesis (Braun-Blanquet 1964), but also the position of particular relevés on the scatter diagram of DECORANA ordination (Hill 1979, Hill et Gauch 1980) has been taken into account. The nomenclature of plant species follows Neuhäuslová et Kolbek (1982).

AREA UNDER STUDY

The area under study includes the middle part of the Slovakian side of the Biele Karpaty Mts., approximately between the villages of Pruské and Moravské Lieskové, the Čachtické Hills in the northernmost promontory of the Malé Karpaty Mts., marginal areas of the middle and northern parts of the Povážský Inovec Mts. and the eastern and southern marginal parts of the Strážovská Upland.

Geologically, the Biele Karpaty Mts. are composed of flysch facies of Paleocene and Eocene ages. Along the southeastern margin of the flysch runs the klippen belt composed of Jurassic and Cretaceous limestones. The Čachtické Hills consist predominantly of Triassic dolomites and limestones, only in the southern part limestones of Cretaceous age are present. The mountain ridge of the Povážský Inovec Mts. consists of nutrient-poor gneisses of Cambrian and Pre-Cambrian ages and granitoids. In lower marginal parts Upper-Paleozoic and Mesozoic sediments occur, of which Triassic dolomites and limestones are the most important. The Strážovská hornatina Upland is composed predominantly of limestones and dolomites of Triassic, Jurassic and Cretaceous age. Basins between mountain systems are overlaid by Neogene deposits and locally also by loess.

Climatic conditions of the area are under strong orographical control. The Váh valley has warm to moderately warm, moderately dry to humid intermontane basin climate with great temperature inversion; mean temperature of January ranges from -2 to -5°C , that of July from 17 to 20°C with mean annual precipitation of 600–800 mm. In the lower mountain areas where the thermophilous oak forests occur, warm to moderately cool, humid to very humid montane climate with small temperature inversion predominates; mean temperature of January is -2 to -6°C , that of July 16 – 19.5°C , mean annual precipitation 600–900 mm. Lowlands in the southern part of the Váh basin and in the Bebrava basin have prevalently warm, dry to moderately dry lowland climate with mean temperature inversion; mean temperature of January is -1.5 to -4°C , that of July 18.5 – 19.5°C , mean annual precipitation 650–700 mm (Michalko et al. 1986).

RESULTS: DESCRIPTION OF SYNTAXA

Pruno mahaleb-Quercetum pubescentis Jakucs et Fekete 1957 (Tab. 1, rel. 1–30)

Syn.: *Quercetum lanuginosae pannonicum* Dostál 1933 p.p. (Art. 34); *Dictamnno-Sorbetum* Knapp 1942 p.p. (Art. 1); *Quercetum pubescentis praecarpaticum* sensu Futák 1947 p.p., non Klika 1937 (Art. 34); *Quercetum pubescentis praecarpaticum* subass. with *Cotinus coggygria* Futák 1947 p.p. (Art. 34); *Querceto-Torminaletum orientale* Jurko 1951 (Art. 34); *Quercus pubescens-Lithospermum purpureo-coeruleum* Michalko 1957 (Art. 36); *Quercetum pubescentis caricetosum humilis* Michalko 1957 (Art. 36); *Cotino-Quercetum pubescentis seslerietosum variae (praecarpaticum)* (Futák 1947) Jakucs et Fekete ex Jakucs 1961 (syntax. syn.); non: *Lathyro versicoloris-Quercetum pubescentis* Klika (1928) 1932.

Nomenclatural typus: Michalko (1957): pp. 69–71, tab. 6, relevé 1 (lectotypus hoc loco).

The dwarfish forest stands with an open canopy, dominated by *Quercus pubescens*, with *Q. virgiliana* also present. The shrub layer consists especially of thermophilous species, e.g. *Cornus mas* and *Viburnum lantana*. The herb layer is rich in species; those of steppe habitats prevail. Dominants of this layer are

Brachypodium pinnatum, *Carex humilis*, *Vincetoxicum hirundinaria*, and *Festuca rupicola*. The ground cryptogam layer is scarce.

It usually occurs on large areas on sunny slopes of southern aspects in lower altitudes in the warmest parts of the territory under study. The soils are rendzinas on limestones or dolomites, often very shallow with islets of protruding parent rocks.

The stands of this community were recorded in the Čachtické Hills, on limestone hillocks near Nové Mesto n. Váh., in the Tematínske Hills, in the Kňaží stôl mountain group and in the southern promontories of the Strážovská hornatina Upland between Uhrovec and Partizánske. An isolated locality was recorded on the limestones of the klippen belt near Krivoklát village in more northern part of the Váh basin (Fig. 1).

From the territory under study, stands belonging to this association were described by Sillinger (1931), Futák (1947), Jakucs (1961), and Maglocký (1979). From a more southern part of the Malé Karpaty Mts., data exist from Plavecké Podhradie and Plavecký Peter villages (Jakucs 1961, Neuhäuslová-Novotná 1970).

Classification of the stands from the area under study into the association *Cotino-Quercetum pubescentis* (Soó 1931) Zólyomi, Jakucs et Fekete ex Jakucs 1961 (Jakucs 1961) is not well-founded because the only western Slovakian locality of *Cotinus coggygria* is Smradlavý vrch hill near Timoradza where it occurs in a stand undoubtedly belonging to the association *Pruno mahaleb-Quercetum pubescentis*. From the phytogeographical point of view, the *Cotino-Quercetum pubescentis* is typical of the Transdanubian part of the Hungarian Medium Range (cf. Jakucs et Fekete 1957, Zólyomi 1958, Jakucs 1961 etc.) and it does not occur in Slovakia at all.

Seslerio albicantis-Quercetum pubescentis ass. nova hoc loco (Tab. 1, rel. 31-41)

Syn.: *Quercetum pubescentis praecarpaticum* sensu Futák 1947 p.min. p., non Klika 1937 (Art. 34); non: *Cotino-Quercetum pubescentis seslerietosum variaie (praecarpaticum)* (Futák 1947) Jakucs et Fekete ex Jakucs 1961.

Nomenclatural typus: tab. 1, relevé 34 (holotypus hoc loco).

Open and dwarfish forest stands dominated by *Quercus pubescens* and hybrids of *Q. dalechampii* × *pubescens*, accompanied by *Fagus sylvatica*. Dominant shrubs of usually scarce understory are *Cornus mas* and *Sorbus aria*. In the herb layer, *Carex humilis*, *Sesleria albicans*, and *Inula ensifolia* predominate. Many species of Carpathian flora are present in the stands: *Acinos alpinus*, *Polygala amara* subsp. *brachyptera*, *Carduus glaucinus*, *Pulsatilla subslavica*, *Phyteuma orbiculare*, *Galium austriacum*, etc. The ground layer is poorly developed.

The community vicariates with the preceding one along an altitudinal gradient and in the areas under stronger influence of the Carpathian flora. It is typical of the sunny slopes with southern aspect in moderately higher altitudes. Usually it forms small islets surrounded by limestone or dolomite beech forests. The soils are rendzinas on limestone or dolomite, usually shallow, only several cm thick.

The stands of this association occur only in the Strážovská hornatina Upland (Fig. 1).

From the materials published in literature, relevé 2 in tab. III in Futák (1947) belongs to this association.

Corno-Quercetum Máthé et Kovács 1962 (Tab.1, rel. 42–53)

Syn.: *Quercetum lanuginosae pannonicum* Dostál 1933 p.p. (Art. 34); *Quercetum pubescentis praecarpaticum* Klika 1937 p.min.p. (Art. 34); *Quercetum pubescentis praecarpaticum* sensu Futák 1947 p.p., non Klika 1937 (Art. 34); *Dictamno-Sorbetum* Knapp 1942 p.p. (Art. 1); ass. *Quercus petraea-Lithospermum purpureo-coeruleum* sensu Michalko 1957, non Br.-Bl. 1932 (Art. 31); *Corneto-(Lithospermo-) Quercetum* Jakucs et Zólyomi in Zólyomi et Jakucs 1957 p.p. (Art. 2b, 10); non: *Lithospermo-Quercetum* Br.-Bl. 1932.
Nomenclatural typus: Máthé et Kovács (1962): p. 317, tab. 2, relevé 1 (lectotypus hoc loco).

The canopy is composed mainly of *Quercus petraea* s.l., sometimes, especially in stands neighbouring on *Pruno mahaleb-Quercetum pubescentis*, *Q. pubescens* s.l. is also present. Dominant understorey shrubs include *Cornus mas* and *Crataegus monogyna*. The herb layer is usually dominated by *Melica uniflora* which is accompanied besides the *Quercion pubescenti-petraeae* species by many species typical of oak-hornbeam forests (*Campanula rapunculoides*, *Brachypodium sylvaticum*, *Asarum europaeum*, *Lathyrus vernus*, etc.). *Laser trilobum* may also be a dominant species of the herbaceous understorey. In the ground layer, only several mosses with low cover degree occur.

The *Corno-Quercetum* is a community representing the transition from carbonate xerothermic oak forests to oak-hornbeam forests on limestone substrata which were described by Michalko (1983) as an association *Hacquetio-Carpinetum betuli* from the Biele Karpaty Mts. In low-lying areas where it links up with the *Pruno mahaleb-Quercetum pubescentis*, it occurs on cooler and more humid slopes of eastern and western aspects and in habitats with temperature inversion in valleys etc. In higher altitudes, it forms islets among oak-hornbeam forests (usually *Carici pilosae-Carpinetum* Neuhäusl et Neuhäuslová-Novotná 1964). The bedrock is formed of limestone, the soils developed on it are slightly deeper and more humic than in the case of the two foregoing associations.

The most abundant occurrence of this association was recorded on limestones of the klippen belt in the Biele Karpaty Mts. Further it occurs in the Povážsky Inovec Mts. and the southern part of the Strážovská hornatina Upland (Fig. 1).

From the territory under study, this community was recorded by Klika (1937) and Futák (1947).

Festuco heterophyllae-Quercetum Neuhäusl et Neuhäuslová-Novotná 1964 (Tab. 1, rel. 54–55)

Nomenclatural typus : Neuhäusl et Neuhäuslová-Novotná (1964): pp. 24–27, tab. III, relevé 32 (lectotypus hoc loco).

Quercus petraea s.l. stands with scarce shrub layer. Herbaceous understorey is dominated by *Poa nemoralis* and *Festuca heterophylla*. Species of xerothermic oak

and oak-hornbeam forests tolerating acid soil are also present. The ground layer is scarce.

The *Festuco heterophyllae-Quercetum* represents a transitional vegetation between acidophilous xerothermic oak forests and oak-hornbeam forests. It occurs on sunny southern slopes on acid crystalline rocks. The soils are only several cm thick rankers with high content of gravel.

The community is rare in the territory under study. Its distribution is limited to the marginal parts of the Povážský Inovec Mts. on crystalline bedrock (Fig. 1).

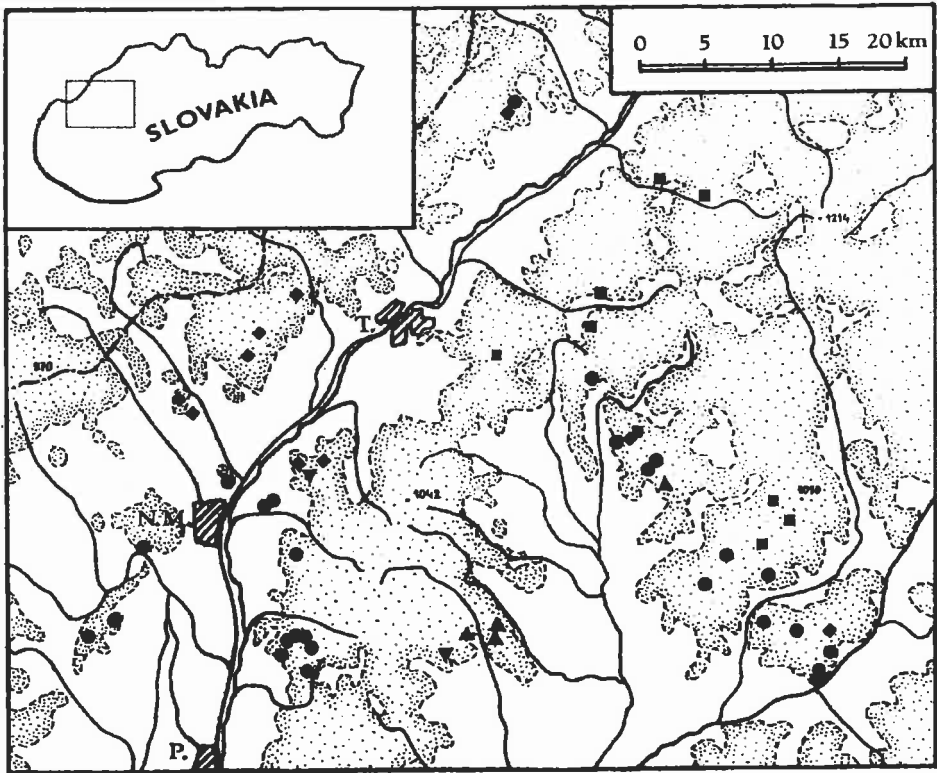


Fig. 1. Localities of relevés of xerothermic oak forests in the middle Váh basin and the southern part of the Strážovská hornatina Upland (● *Pruno mahaleb-Quercetum pubescentis*, ■ *Seslerio albicantis-Quercetum pubescentis*, ◆ *Corno-Quercetum*, ▼ *Festuco heterophyllae-Quercetum*, ▲ *Potentillo albae-Quercetum*).

It is reported by Neuhäuslová-Novotná (1970) from the southern part of the Malé Karpaty Mts.

***Potentillo albae-Quercetum* Libbert 1933 (Tab. 1, rel. 56–59)**

Nomenclatural typus: Libbert (1933): pp. 297–299, tab. XXV, relevé 1 (lectotypus hoc loco).

Forests with high, almost closed canopy formed of pure *Quercus petraea* s.l. Presence of scattered understory of small shrubs, dominated by *Frangula alnus*, is typical. In the herb layer, *Festuca heterophylla*, *Fragaria moschata*, *Melampyrum pratense* and *Poa nemoralis* prevail. Species of habitats humid in spring and dry in summer are typical of this community (*Molinia caerulea*, *Potentilla alba*, *Selinum carvifolia*, etc.). The ground layer has low cover of mosses, *Dicranella heteromalla* typically occurs in these stands.

Typical community of xerothermic oak forests on substrata with changeable humidity regime. It occurs on flat terrain or on moderate slopes on Neogene sediments, loess, and loess loams.

The stands of this association were recorded in the marginal parts of the Bebrava basin bounded by the Povážský Inovec Mts. and the Strážovská hornatina Upland (Fig. 1). In the past, this community was probably widespread in the Bebrava basin in which agricultural land predominates at present.

LOCALITIES OF RELEVÉS

Pruno mahaleb-Quercetum pubescentis

1. Krivoklát, SE slopes 0.8 km W of the village, altitude 450 m, aspect WSW, inclination 45°, cover E₃=70 %, E₂=50 %, E₁=70 %, E₀=5 %, sample area 200 m², 31.5.1991.
2. Slatinka nad Bebravou, S slopes 1 km NW of the village, 460 m, S, 20°, 50 %, 40 %, 70 %, 1 %, 200 m², 24.5.1991.
3. Timoradza, S slopes of Smradlavý vrch hill 1.8 km NE of the village, 280 m, SSW, 30°, 40 %, 40 %, 80 %, 0 %, 100 m², 6.6.1991.
4. dtto, 280 m, SSW, 5°, 80 %, 20 %, 80 %, 5 %, 100 m², 6.6.1991.
5. Timoradza, S slopes of a range between Kňazí stôl and Ostrý vrch hills 3.8 km ESE of the village, 480 m, SW, 20°, 80 %, 30 %, 80 %, 5 %, 200 m², 21.6.1991.
6. Ľutov, S slopes of Ostrý vrch hill 1.8 km N of the village, 480 m, SSE, 15°, 70 %, 20 %, 80 %, 5 %, 200 m², 21.6.1991.
7. Trenčianske Bohuslavice, SE slopes of Turecký vrch hill above the railway 1.5 km S of the village, 270 m, SW, 25°, 90 %, 60 %, 70 %, 5 %, 200 m², 18.5.1991.
8. dtto, 290 m, S, 10°, 80 %, 70 %, 60 %, 5 %, 200 m², 18.5.1991.
9. Kálnica, S slopes 1 km NNW of the village, 280 m, SSE, 5°, 90 %, 70 %, 50 %, 5 %, 200 m², 27.5.1991.
10. Kálnica, SE slopes 1.3 km WNW of the village, 240 m, ESE, 20°, 70 %, 70 %, 60 %, 5 %, 100 m², 27.5.1991.
11. Kočovce, S slopes of Sochoň hill 2.3 km E of the village, 460 m, S, 10°, 70 %, 50 %, 50 %, 5 %, 100 m², 16.5.1991.
12. Uhrovec, S slopes of Jankov vršok hill 2.3 km ESE of the village, 470 m, SE, 20°, 70 %, 40 %, 90 %, 3 %, 200 m², 22.6.1991.
13. Dolné Vestenice, S slopes 1.3 km NNE of the village, 440 m, SSE, 10°, 80 %, 30 %, 80 %, 5 %, 200 m², 16.6.1991.
14. Miezgovce, S slopes of Ostrý vrch hill 2.5 km E of the village, 430 m, SSW, 30°, 70 %, 30 %, 80 %, 10 %, 200 m², 22.6.1991.
15. Dolné Vestenice, SE foothills of Chotoma hill 2 km S of the village, 300 m, SE, 30°, 60 %, 60 %, 80 %, 10 %, 100 m², 16.6.1991.
16. Nitrica, S slopes of a range 0.5 km WSW of Stráže hill 2.5 km SW of the village, 300 m, S, 15°, 70 %, 10 %, 80 %, 10 %, 200 m², 16.6.1991.

17. Chalmová, S slopes 0.7 km W of the village, 320 m, S, 15°, 70 %, 15 %, 80 %, 10 %, 200 m², 16.6.1991.
18. Oslany, S slopes of Velký vrch hill 2.3 km NW of the village, 430 m, ESE, 30°, 80 %, 20 %, 60 %, 5 %, 200 m², 16.6.1991.
19. dtto, 440 m, ESE, 20°, 80 %, 40 %, 70 %, 5 %, 200 m², 16.6.1991.
20. Višňové, S slopes above the Jablonka creek 2 km NE of the village, 370 m, SW, 30°, 60 %, 30 %, 80 %, 5 %, 200 m², 20.5.1991.
21. dtto, 350 m, S, 35°, 70 %, 50 %, 80 %, 5 %, 200 m², 19.5.1991.
22. Částkovce, SE foothills of Velký Plešivec hill 3 km WNW of the village, 300 m, SW, 10°, 80 %, 40 %, 70 %, 3 %, 200 m², 19.5.1991.
23. Krajiné, S slopes of Salášky hill 2.7 km ESE of the village, 430 m, S, 10°, 90 %, 50 %, 60 %, 5 %, 200 m², 19.5.1991.
24. Lúka, S slopes between Ihelník hill and Tematín castle 3.4 km NE of the village, 480 m, SSE, 20°, 90 %, 60 %, 70 %, 1 %, 200 m², 26.5.1991.
25. Lúka, SW slopes below Tematín castle 4 km NE of the village, 500 m, SW, 20°, 80 %, 40 %, 80 %, 3 %, 200 m², 26.5.1991.
26. Stará Lehota, SW slopes of Kňažný hill 2 km NW of the village, 550 m, SW, 10°, 90 %, 70 %, 70 %, 3 %, 200 m², 26.5.1991.
27. Lúka, E slopes between Ihelník and Bôrovište hills 2.8 km NE of the village, 370 m, E, 20°, 80 %, 40 %, 80 %, 0 %, 200 m², 26.5.1991.
28. Lúka, S slopes of Bôrovište hill 2.2 km NE of the village, 390 m, S, 25°, 90 %, 60 %, 60 %, 3 %, 200 m², 26.5.1991.
29. Stará Lehota, SW slopes of Rovence hill 1.5 km WSW of the village, 460 m, SSW, 20°, 80 %, 30 %, 80 %, 0 %, 200 m², 26.5.1991.
30. dtto, 450 m, SW, 15°, 80 %, 40 %, 80 %, 0 %, 200 m², 26.5.1991.

Seslerio albicantis-Quercetum pubescentis

31. Velké Košecké Podhradie, S slopes above the road crossing 1 km W of the village, 400 m, S, 40°, 40 %, 20 %, 70 %, 5 %, 200 m², 22.5.1991.
32. dtto, 420 m, ESE, 35°, 50 %, 20 %, 80 %, 5 %, 200 m², 22.5.1991.
33. Kopec, S slopes above the road crossing 2.2 km N of the village, 450 m, SSE, 25°, 40 %, 10 %, 90 %, 0 %, 100 m², 22.5.1991.
34. Omšenie, SW slopes of Baba hill 1 km NE of the village, 500 m, SW, 45°, 40 %, 30 %, 80 %, 10 %, 200 m², 5.6.1991.
35. Omšenie, S slopes in Baske Nature Reserve 2.8 km S of the village, 650 m, S, 40°, 70 %, 30 %, 80 %, 10 %, 150 m², 2.6.1991.
36. dtto, 650 m, SSE, 35°, 60 %, 30 %, 80 %, 0 %, 200 m², 2.6.1991.
37. Kubrica, S slopes above the Kubrica creek 2.3 km ESE of the village, 550 m, SSE, 45°, 50 %, 15 %, 90 %, 3 %, 400 m², 15.5.1991.
38. Timoradza, SW slopes of Udrina hill 2.5 km ENE of the village, 570 m, S, 2°, 50 %, 40 %, 80 %, 40 %, 200 m², 21.6.1991.
39. Uhrovske Podhradie, S slopes of a valley 3 km E of the village, 800 m, S, 25°, 70 %, 5 %, 70 %, 5 %, 200 m², 22.6.1991.
40. Uhrovske Podhradie, S slopes 0.5 km SW of the summit of Malý Rokoš hill 4 km E of the village, 900 m, S, 30°, 50 %, 20 %, 80 %, 5 %, 150 m², 22.6.1991.
41. Uhrovec, S slopes of a range between Jankov vršok and Holý vrch hills 3.5 km E of the village, 580 m, SSW, 15°, 60 %, 10 %, 80 %, 2 %, 200 m², 22.6.1991.

Corno-Quercetum

42. Krivoklát, E slopes of Košariská valley 2 km SW of the village, 420 m, ESE, 30°, 80 %, 70 %, 50 %, 0 %, 200 m², 31.5.1991.
43. Krivoklát, SW slopes of Košariská valley 1.7 km SW of the village, 450 m, SW, 40°, 90 %, 60 %, 70 %, 5 %, 200 m², 31.5.1991.
44. Drietoma, S slopes 2 km NNW of the village, 640 m, SSW, 35°, 80 %, 20 %, 80 %, 5 %, 150 m², 1.5.1991.
45. Kochanovce, S slopes of Horné bradlo hill 4.5 km NW of the village, 540 m, 20°, 90 %, 60 %, 70 %, 5 %, 200 m², 13.5.1991.
46. Melčice, S slopes of Lukovský vrch hill 4.7 km NW of the village, 540 m, S, 20°, 80 %, 40 %, 80 %, 0 %, 200 m², 21.5.1991.
47. Zemianske Podhradie, S slopes of Hlohová hill 2 km W of the village, 520 m, S, 40°, 90 %, 40 %, 60 %, 10 %, 200 m², 20.6.1991.
48. Zemianske Podhradie, SE slopes of Lysica hill 1 km SW of the village, 400 m, SSE, 20°, 70 %, 60 %, 80 %, 10 %, 200 m², 20.6.1991.
49. Krivosúd-Bodovka, SW slopes of the Humništia hill 2 km SSE of the village, 450 m, SW, 15°, 80 %, 60 %, 70 %, 0 %, 200 m², 19.6.1991.
50. Beckov, a plateau 2.5 km NE of the village, 360 m, WSW, 5°, 90 %, 50 %, 80 %, 5 %, 200 m², 30.5.1991.
51. Timoradza, SW slopes of Udrina hill 2.5 km ENE of the village, 450 m, WSW, 20°, 60 %, 50 %, 80 %, 10 %, 200 m², 6.6.1991.
52. dtto, 550 m, SSE, 15°, 90 %, 10 %, 80 %, 30 %, 200 m², 21.6.1991.
53. Nitrica, SW foothills of Drieňový vrch hill 2.5 km SSE of the village, 500 m, WSW, 10°, 90 %, 20 %, 70 %, 10 %, 200 m², 16.6.1991.

Festuco heterophyllae-Quercetum

54. Beckov, SW slopes of Lašid hill 2.5 km E of the village, 420 m, SW, 5°, 80 %, 10 %, 80 %, 10 %, 200 m², 30.5.1991.
55. Podhradie, SW slopes above the Slivnica creek 1 km NE of the village, 370 m, SSW, 25°, 90 %, 0 %, 70 %, 3 %, 200 m², 23.6.1991.

Potentillo albae-Quercetum

56. Ľutov, forest 1.2 km E of the village, 310 m, S, 5°, 90 %, 10 %, 60 %, 5 %, 200 m², 21.6.1991.
57. Malé Hoste, forest 1.2 km SW of the village, 330 m, SSW, 5°, 80 %, 20 %, 80 %, 5 %, 200 m², 23.6.1991.
58. Nemečky, forest 1.2 km W of the N margin of the village, 320 m, -, 0°, 80 %, 20 %, 80 %, 3 %, 200 m², 23.6.1991.
59. Nemečky, forest 0.8 km ENE of the N margin of the village, 310 m, SE, 5°, 70 %, 10 %, 90 %, 5 %, 200 m², 23.6.1991.

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Tab. 1: Xerothermic oak forests (1-30 *Pruno mahaleb-Quercetum pubescentis*, 31-41 *Sclerio albicantis-Quercetum pubescentis*, 42-53 *Corno-Quercetum*, 54-55 *Festuco heterophyllae-Quercetum*, 56-59 *Potentillo albae-Quercetum*).

Releve nr.	123456789111111111112222222223	K1	3333333344	K2	4444444555	K3	55	K4	6555	K5
	012345678901234567890		12345678901		234567890123		45		6789	
E1 - tree layer										
<i>Quercus pubescens</i> s.l.	42336464444454445444565655555100	33223932433100			15243	42				
<i>Fagus sylvatica</i>	1	7	2222211112	91		17				
<i>Pinus sylvestris</i>	++1	10	++	45						
<i>Carpinus betulus</i>					+1	2	331			
<i>Quercus petraea</i> s.l.	1.22	10			55454564	32	83	65100	5545100	
<i>Sorbus torminalis</i>	1.211	23								
<i>Acer campestre</i>	1	7								
<i>Sorbus aria</i> s.l.		3								
<i>Quercus cerris</i>	2	3								
Epiphytes:										
<i>Loranthus europaeus</i>	+ + + + +	13								
E2 - shrub layer										
<i>Viburnum lantana</i>	21+	17								
<i>Sorbus torminalis</i>	1	27								
<i>Quercus pubescens</i> s.l.	1	23								
<i>Juniperus communis</i>	1	23								
<i>Crataegus monogyna</i> s.l.	1	77								
<i>Acer campestre</i>	22	30								
<i>Cornus mas</i>	2222122222221111223222	93								
<i>Sorbus aria</i> s.l.	+ + +	30								
<i>Fagus sylvatica</i>		3								
<i>Crataegus laevigata</i> s.l.										
<i>Frangula alnus</i>										
<i>Ligustrum vulgare</i>	++1.2221.1.22.111+.21112.2.	70								
<i>Rosa cf. canina</i>	1++ .1.2+1 1++ +.++ .+1+	57								
<i>Corylus avellana</i>	.22+ +21 .1.1.1.+1+	40								
<i>Pyrus pyraeaster</i>		13								
<i>Berberis vulgaris</i>		7								
<i>Rubus fruticosus</i> s.l.		10								
<i>Carpinus betulus</i>		7								
<i>Lonicera xylosteum</i>		10								
<i>Tilia cordata</i>		7								
<i>Swida sanguinea</i> s.l.		10								
<i>Quercus petraea</i> s.l.		10								
<i>Eonymus verrucosus</i>		3								
<i>Cotoneaster tomentosus</i>		7								
<i>Cotinus coggygria</i>		7								
<i>Fraxinus excelsior</i>		3								
<i>Ulmus minor</i>		3								
<i>Cerasus mahaleb</i>										
E3 - herb layer										
<i>Poa angustifolia</i>	+++++1+11 ++1+++.1+.+++2+1	83								
<i>Carex michelii</i>	1+++1+++1+++ + + + + +1. +. +.	70								
<i>Festuca rupicola</i>	1.1.12+11.21.++1.1+11+.++111	70								
<i>Coronilla varia</i>	2.++1+++.++11.++1++.	59								
<i>Ajuga reptans</i>	++ + + + + + + + + + + + + + +	43								
<i>Achillea millefolium</i> s.l.	++ + + + + + + + + + + + + + +	40								
<i>Thlaspi perfoliatum</i>	1.++ + + + + + + + + + + + + + +	27								
<i>Viburnum lantana</i> juv.	++ + + + + + + + + + + + + + +	27								
<i>Inula conyzia</i>	++ + + + + + + + + + + + + + +	27								
<i>Allium flavum</i>	++ + + + + + + + + + + + + + +	27								
<i>Piptatherum virescens</i>	121+1.1.1. . . .	23								
<i>Stachys recta</i>	++ + + + + + + + + + + + + + +	23								
<i>Medicago falcata</i>	++ + + + + + + + + + + + + + +	23								
<i>Sedum sexangulare</i>	++ + + + + + + + + + + + + + +	20								
<i>Clematis recta</i>	++ + + + + + + + + + + + + + +	20								
<i>Ranunculus polyanthemus</i>	++ + + + + + + + + + + + + + +	20								
<i>Festuca valesiaca</i>	1. + .1. + .1.1.	20								
<i>Sesleria sibirica</i>	++ + + + + + + + + + + + + + +	17								
<i>Leontodon incanum</i>	++ + + + + + + + + + + + + + +	17								
<i>Acinus alpinus</i>	++ + + + + + + + + + + + + + +	17								
<i>Viola collina</i>	++ + + + + + + + + + + + + + +	17								
<i>Geranium sanguineum</i>	++ + + + + + + + + + + + + + +	17								
<i>Inula ensifolia</i>	++ + + + + + + + + + + + + + +	20								
<i>Teucrium montanum</i>	++ + + + + + + + + + + + + + +	3								
<i>Coronilla coronata</i>	++ + + + + + + + + + + + + + +	3								
<i>Polygala amara</i> ssp. <i>brachyptera</i>	++ + + + + + + + + + + + + + +	3								
<i>Cerdoxus glaucinus</i>	++ + + + + + + + + + + + + + +	7								
<i>Globularia punctata</i>	++ + + + + + + + + + + + + + +	7								
<i>Jovibarba hirta</i> s.l.	++ + + + + + + + + + + + + + +	10								
<i>Dorycnium pentaphyllum</i> s.l.	++ + + + + + + + + + + + + + +	10								
<i>Campanula corvatica</i>	++ + + + + + + + + + + + + + +	7								
<i>Thalictrum minus</i> s.l.	++ + + + + + + + + + + + + + +	7								
<i>Anthyllis vulneraria</i>	++ + + + + + + + + + + + + + +	7								
<i>Pulsatilla subslavica</i>	++ + + + + + + + + + + + + + +	7								
<i>Phyteuma orbiculare</i>	++ + + + + + + + + + + + + + +	7								
<i>Epipactis atrorubens</i>	++ + + + + + + + + + + + + + +	7								
<i>Gentiana scabra</i>	++ + + + + + + + + + + + + + +	7								
<i>Laserpitium latifolium</i>	++ + + + + + + + + + + + + + +	13								
<i>Galium austrasicum</i>	++ + + + + + + + + + + + + + +	33								
<i>Campanula runcunculoides</i>	++ + + + + + + + + + + + + + +	33								
<i>Acer campestre</i> juv.	++ + + + + + + + + + + + + + +	23								
<i>Astragalus glycyphyllos</i>	++ + + + + + + + + + + + + + +	23								
<i>Asarum europaeum</i>	++ + + + + + + + + + + + + + +	13								
<i>Lathyrus vernus</i>	++ + + + + + + + + + + + + + +	33								

Tab. 1. (Cont.)	1234567891111111112222222222223 K1	3333333334 K2	444444445555 K3	55 K4	6555 K5	6789 K6
	012345678901234567890	12345678901	234567890123	45	6789	6789
<i>Neottia nida-avis</i>	13	9	17	50		
<i>Crataegus</i> sp. juv.	13	27	17			
<i>Platanthera bifolia</i>	17	18	8			25
<i>Lilium martagon</i>	10	36	17			
<i>Genista tinctoria</i>	13	18				50
<i>Festuca pallens</i>	13	36				
<i>Galium aparine</i>	10	22	33	50		
<i>Hieracium pilosella</i>	13	27				
<i>Thymus praecox</i>	13	27				
<i>Ranunculus bulbosus</i>	17	9	8			
<i>Chamaecytisus hirsutus</i>	13	27				
<i>Seseli oaseum</i>	13	27				
<i>Cardaminopsis arenosa</i>	7	18	26			
<i>Campanula glomerata</i>	17	18				
<i>Carpinus betulus</i> juv.	13	18	17			25
<i>Hieracium maculatum</i>	13	27				
<i>Cephalanthera damasonium</i>	13	8	8			
<i>Asplenium ruta-muraria</i>	13	18				
<i>Carex cf. spicata</i>	13		8			
<i>Campanula trachelium</i>	7	25				
<i>Corylus avellana</i> juv.	13		8			25
<i>Myosotis sylvatica</i>	13	9				
<i>Cerastium arvense</i>	10	18				25
<i>Bromus monensis</i>	13					25
<i>Arrhenatherum elatius</i>	10					25
<i>Quercus petraea</i> s.l. juv.	3	9	25	50	19	50
<i>Viola x scabra</i>	10	18				
<i>Mercurialis perennis</i>	13	18	8			
<i>Sedum album</i>	10					
<i>Fragaria viridis</i>	10	9				
<i>Dianthus caryophyllorum</i> s.l.	10	9				
<i>Ophrys insectifera</i>	3	27				
<i>Cephalanthera rubra</i>	10	9				
<i>Carex digitata</i>	10	1	25			26
<i>Galium verum</i>	10					
<i>Bromus benekenii</i>	3	9	17			
<i>Lepidium campestre</i>	7	18				
<i>Inula hirta</i>	3	18	8			
<i>Arabis turrita</i>	13		9			50
<i>Vicia sativa</i>	3	9	25			50
<i>Hieracium sphenodylitium</i>	3					
<i>Melandrium album</i>	10					
<i>Asplenium trichomanes</i>	3		17			
<i>Clematis vitalba</i>	7		8			
<i>Scabiosa ochroleuca</i>	7	9				
<i>Pyrus pyraeaster</i> juv.	7		8			
<i>Berberis vulgaris</i> juv.	10					
<i>Polygala major</i>	7	9				
<i>Thymus glaberrimus</i>	7	9				
<i>Lactuca perennis</i>	3	18				
<i>Epipactis</i> sp.	3	18				
<i>Salvia glutinosa</i>	3		8	50		
<i>Potentilla arenaria</i>	10					
<i>Koeleria macrantha</i>	7	9				
<i>Rosa gallica</i>	7					25
<i>Viola casabieba</i>	7					25
<i>Acer platanoides</i> juv.	7		8			
<i>Convallaria majalis</i>	3	2	17			
<i>Dentaria bulbifera</i>	3		17			25
<i>Crucifera glabra</i>	7		17			
<i>Turritia glabra</i>	7					
<i>Arenaria serpyllifolia</i> s.l.	7					
<i>Plantago media</i>	7					
<i>Agrimonia eupatoria</i>	7					
<i>Carlina vulgaris</i> s.l.	3	9				
<i>Cotinus coggygria</i> juv.	7					
<i>Chamaecytisus supinus</i>	7					
<i>Rhamnus catharticus</i> juv.	7					
<i>Carlina aculeata</i>	3	9				
<i>Platanthera chlorantha</i>	3	9				
<i>Tilia cordata</i> juv.	7					
<i>Viola mirabilis</i>	7					
<i>Dictamnus albus</i>	7					
<i>Aster amellus</i>	3	9				25
<i>Cerastium avium</i> juv.	3					
<i>Centaurea trifurcata</i>	3	9				
<i>Rubus fruticosus</i> s.l.	3	9				25
<i>Silene vulgaris</i> ssp. antelopum	3	9				
<i>Limonium abortivum</i>	3		8			
<i>Epipactis microphylla</i>	7					
<i>Lotus corniculatus</i>	3	9				
<i>Leucantheum vulgare</i> s.l.	3	9				
<i>Chamaecytisus ratisbonensis</i>	7					
<i>Linaria genistifolia</i>	7					
<i>Platanthera</i> sp.	3	9				
<i>Euonymus verrucosus</i> juv.	7					
<i>Carex caryophylla</i>	7	18				
<i>Cephalanthera longifolia</i>	7	18				50
<i>Thesium alpinum</i>	7	18				
<i>Cerastium mahnleb</i> juv.	7	18				
<i>Koeleria saxatilis</i>	7	18				
<i>Orchis purpurea</i>	7	18		17		

Tab. 1. (Cont.)	12345678911111111122222222223	K1	333333334	K2	44444445565	K3	55	K4	6555	K5					
	012345678901234567890		12345678901		234567890123		45		6789						
<i>Digitaria grandiflora</i>	.....		.....		.....		8	+	60	.....				
<i>Hypericum montanum</i>	.....		.....		.....		8	.....	.....	25				
<i>Iris graminea</i>	.....		.....		.....		17	.....	.....	.....		
<i>Solidago virgaurea</i>	.....		.....		.....		+	60	.....	25				
Eo - ground cryptogam layer															
<i>Hypnum cupressiforme</i>	++ 111.1111++2112.1++111+1.1..	80	1	+	11.	36	+	11.	++1211	83	1.	60	+	++	75
<i>Camptothecium lutescens</i>	1..4*...+*... .. 11..+*... ..	27	..	+	11..+	45	1	.....	2.	25	.....	.....	.....	.....
<i>Tortella inclinata</i>	+ +.....+ + + 1.....+ + ..	17	11.	21.	+	.....	46	.....	1.	8	.....	.....	.....	.....
<i>Bryum sp.</i>	-.....+ +.....+ + ..	20	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
<i>Anblystegium serpens</i>	.....+ +.....1.....+ + ..	17	.....	.....	.....	.....	9	.....	.....	111	.....	.....	.....	.....
<i>Brachythecium velutinum</i>	.....+ +.....+ + ..	7	.....	.....	.....	.....	.....	.....	11.	17	.....	1.	.....	25
<i>Dicranella heteromalla</i>	.....+ +.....+ + ..	10	.....	.....	.....	.....	.....	.....	.....	.....	1	60	+	11+100
<i>Tortula ruralis</i>	.....+ +.....+ + ..	10	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
<i>Cladonia coniocraea</i>	.....+ +.....+ + ..	7	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
<i>Encalypta streptocarpa</i>	.....+ +.....+ + ..	7	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
<i>Fissidens cristatus</i>	.....+ +.....+ + ..	7	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
<i>Sclatidium apocarpum</i>	.....+ +.....+ + ..	3	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
<i>Abietinella abietina</i>	.....+ +.....+ + ..	7	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
<i>Cladonia pyxidata</i>	.....+ +.....+ + ..	7	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
<i>Tortella tortuosa</i>	.....+ +.....+ + ..	.....	.....	.....	.....	.....	31*	.....	.....	27	.....	.....	.....	.....
<i>Atrichum undulatum</i>+ +.....+ +	1.	60	+	25
<i>Polytrichum formosum</i>+ +.....+ +	50