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Phytosociological notes on the xerophilous oak forests with *Genista pilosa* in south-western Moravia

Fytocenologické poznámky ke xerofilním doubravám s *Genista pilosa* na jihozápadní Moravě

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Genisto pilosae-Quercetum petraeae Zólyomi, Jakucs et Fekete ex Soó 1963, xerophilous oak forest community, is reported and documented by phytosociological relevés from the south-western Moravia river valleys, Czechoslovakia. Its relations to similar Central European communities are briefly discussed.

Introduction

Xerothermous forest communities of south-western Moravian river valleys have been investigated very imperfectly till now. Using the principles of Zlatník's geobiocoenological school, only Horák (1981) studied forest vegetation in the central parts of the valleys of the Rokytná and Jihlava rivers. Moravec (in Moravec et al. 1983) recorded presumable occurrence of associations *Cynancho-Quercetum* Passarge 1957 and *Viscario-Quercetum* Stöcker 1965 for this area. However, a community of open dwarfish oak forests with *Genista pilosa* seems to be the most typical one of the driest and warmest southern slopes in the valleys of the Dyje, Jevišovka, Rokytná and Oslava rivers. This community shows certain relations to similar ones having been described as an association *Genisto pilosae-Quercetum petraeae* Zólyomi, Jakucs et Fekete ex Soó 1963 from the hill countries on the northern borders of the Pannonian Basin. The present paper gives the phytosociological characterization of the oak forests with *Genista pilosa* in south-western Moravia.

Methods

Phytosociological research was carried out according to the classic Zürich-Montpellier methods (Braun-Blanquet 1964). Relevés were taken using the seven-grade Braun-Blanquet's scale of combined abundance and dominance, the syntaxonomical table synthesis was carried out usinng traditional procedures. Plant nomenclature follows Neuhäuslová et Kolbek (1982).

Soil samples were taken from rhizosphere and analysed according to Hraško et al.(1962). The active soil reaction (pH) was measured with a pH-meter with a glass electrode, the exchangeable soil reaction in the KCl-extract. Carbonates ($CaCO_3$) were determined on the basis of measurement of the amounts of CO_2 loosened by the action of HCl in Janko's lime gauge. Oxidizable carbon (C_{ox}) was determined by oxidation

Tab. 1. - Genisto pilosae-Quercetum petraeae ZÓLYOMI, JAKUCS et FEKETE ex SOÓ 1963

Relevé no.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	C
Inclination /°/	15	20	35	40	30	35	45	20	25	45	20	40	25	15	25	15	40	30	20	40	/%/
Orientation	SW	SE	SE	W	W	S	S	S	S	S	S	SW	W	S	S	SE	W	S	W	SW	
Cover E3 /%/	50	40	40	30	40	50	30	50	60	60	50	60	40	50	70	40	40	40	70	50	
Cover E2 /%/	0	0	0	0	0	0	0	0	0	0	0	10	0	0	0	0	15	5	20	10	
Cover E1 /%/	60	70	60	50	80	70	60	70	70	70	50	80	80	80	80	80	80	80	80	60	
Cover E0 /%/	50	60	40	80	60	5	50	60	60	60	60	80	60	20	40	50	50	60	70	70	
No. of species	37	35	34	28	40	36	39	37	42	37	31	41	28	35	39	28	28	38	30	26	
E3 Quercus petraea s.l.	3	3	3	3	3	3	3	3	3	4	3	4	3	3	4	3	3	3	4	3	100
Pinus sylvestris	.	.	.	.	.	.	.	.	2	.	.	.	1	.	.	.	.	.	.	2	15
Carpinus betulus	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	2	10
E3 - epiphytes																					
Loranthus europaeus	.	.	+	+	.	.	.	.	.	.	.	+	+	+	+	.	.	.	.	.	30
E2 Quercus petraea s.l.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	2	2	10
E1 Festuca ovina	2	2	3	3	4	2	2	3	3	3	2	3	3	4	3	4	2	3	4	3	100
Hieracium pilosella	2	1	1	+	+	+	1	+	+	+	1	1	+	+	+	.	+	+	+	+	95
Genista pilosa	+	+	+	1	1	+	1	2	1	1	2	2	2	+	.	r	2	+	1	+	95
Jasione montana	+	+	+	+	+	+	+	+	+	r	+	+	+	+	.	+	+	+	.	.	85
Rumex tenuifolius	+	+	+	1	+	.	+	1	+	.	1	.	+	+	.	+	r	+	1	.	75
Linaria genistifolia	+	.	+	.	+	+	+	+	+	+	1	+	+	+	.	+	.	+	.	1	75
Quercus petraea s.l. juv.	.	.	+	+	.	+	+	1	2	1	+	.	+	+	2	+	1	+	+	.	75
Carex humilis	2	.	.	.	.	2	2	2	1	2	1	2	.	1	3	2	.	3	2	2	70
Steris viscaria	.	1	+	+	+	+	+	+	1	1	.	1	.	.	.	.	+	+	1	.	65
Hypericum perforatum	+	.	.	.	+	+	+	+	.	+	+	+	.	+	+	+	.	+	.	.	60
Luzula divulgata	.	+	+	+	+	.	.	+	+	+	+	+	+	+	.	.	.	+	.	.	60
Euphorbia cyparissias	.	.	.	.	+	+	+	+	.	1	.	+	.	+	+	.	.	1	+	+	55
Festuca pallens	1	1	+	.	.	.	+	+	+	+	+	+	.	.	.	1	.	.	.	.	50
Sedum maximum	+	.	+	.	.	.	.	+	+	+	+	.	.	.	.	+	.	.	+	+	45
Hieracium lachenalii	.	.	.	.	+	+	.	+	.	r	.	+	.	.	+	.	.	+	+	+	45
Vincetoxicum hirundinaria	.	.	.	.	+	.	+	+	.	+	+	+	.	2	.	.	+	.	1	.	45
Agrostis vinealis	.	+	.	.	+	+	+	2	.	.	.	.	1	1	.	.	.	r	.	.	40
Luzula luzuloides	.	+	+	+	+	+	1	.	.	.	.	.	1	.	.	.	.	.	.	.	35
Poa nemoralis	.	+	+	.	+	2	.	.	+	.	.	.	.	2	.	.	.	2	.	.	35
Veronica officinalis	.	.	.	+	.	+	.	.	+	.	+	.	.	+	.	+	.	+	.	.	35
Hieracium cf. sabaudum	.	.	.	+	.	.	.	+	+	+	.	+	.	.	+	.	.	.	+	.	35
Sedum reflexum	+	+	+	.	+	.	.	.	.	r	.	+	.	.	.	.	.	.	.	.	30
Calluna vulgaris	+	1	.	.	.	.	1	.	.	.	.	.	2	+	.	.	2	.	.	.	30
Scleranthus perennis	+	.	1	.	.	.	.	+	+	+	+	.	.	.	.	.	.	.	.	.	30
Asperula cynanchica	+	.	.	.	+	.	.	.	+	.	+	+	.	.	+	.	.	.	.	.	30
Anthoxanthum odoratum	.	+	.	.	2	1	.	.	.	.	.	+	+	.	.	.	2	.	.	.	30
Campanula cf. moravica	.	+	.	.	.	+	+	.	+	+	+	.	.	.	.	.	.	.	.	.	30
Hieracium murorum	.	+	.	1	.	.	.	.	+	.	+	.	.	.	.	+	+	.	.	.	30
Lembotropis nigricans	.	+	.	+	+	+	.	.	.	.	.	+	.	.	1	.	.	.	.	.	30
Anthericum ramosum	.	.	+	.	+	1	+	.	.	+	+	.	.	.	.	.	.	.	.	.	30
Thymus cf. praecox	.	.	+	.	.	+	.	.	+	+	.	.	.	.	+	.	.	.	+	.	30
Galium cf. valdepilosum	.	.	+	+	.	+	.	.	+	.	.	.	.	.	+	.	.	.	.	.	25
Poa angustifolia	.	.	.	r	+	+	.	.	.	.	.	+	.	.	.	.	.	+	.	.	25
Verbascum austriacum	.	.	.	.	1	.	.	+	+	.	+	.	.	.	+	.	.	.	.	.	25
Genista tinctoria	.	.	.	.	.	1	+	+	.	.	.	.	+	.	.	.	.	.	.	+	25
Allium senescens ssp. montanum	.	.	.	.	.	.	+	+	.	1	.	.	.	.	.	.	+	.	+	.	25
Pinus sylvestris juv.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	+	+	+	+	25
Koeleria macrantha	1	.	.	.	.	.	.	+	.	.	.	.	.	+	+	.	.	.	.	.	20
Deschampsia flexuosa	.	3	1	.	.	+	3	.	.	.	.	.	.	.	.	.	.	.	.	.	20
Dianthus carthusianorum s.l.	.	.	.	.	+	.	.	.	.	.	.	+	.	+	+	.	.	.	.	.	20
Polypodium vulgare	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	r	.	+	+		20
Rosa sp. juv.	.	.	.	.	.	.	.	.	+	.	.	r	.	.	+	+	.	.	.	.	20
Teucrium chamaedrys	.	.	+	.	.	.	.	.	.	+	.	.	.	.	+	.	.	.	.	.	15

Tab. 1. - /Continue/

Relevé no.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	C
Trifolium alpestre	.	.	.	.	+	+	+	.	.	.	.	.	.	.	.	.	.	.	.	.	15
Veronica vindobonensis	.	.	.	.	+	.	.	.	.	.	.	.	.	.	+	+	.	.	.	.	15
Polygonatum odoratum	.	.	.	.	.	.	+	+	.	.	.	.	.	.	.	.	r	.	.	.	15
Trifolium arvense	+	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	10
Thymus pulegioides	+	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	10
Eryngium campestre	+	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	10
Seseli osseum	.	.	r	.	.	.	.	.	r	.	.	.	.	.	.	.	.	.	.	.	10
Melampyrum pratense	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	10
Thesium linophyllon	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	10
Sedum sexangulare	.	.	.	.	.	.	.	.	+	.	.	.	.	.	+	.	.	.	.	.	10
Achillea millefolium s.l.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	+	.	.	.	.	10
Phleum phleoides	.	.	.	.	.	.	.	.	.	+	.	+	.	.	.	.	.	.	.	.	10
Allium flavum	.	.	.	.	.	.	.	.	.	.	.	+	.	.	+	.	.	.	.	.	10
Asplenium septentrionale	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	+	.	10
Calamagrostis epigeios	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	+	.	.	10
EO Hypnum cupressiforme	r	2	1	2	+	1	.	1	2	3	2	.	1	2	2	3	1	2	2	2	90
Polytrichum piliferum	2	3	2	.	1	.	2	2	2	2	2	.	2	1	.	.	+	.	3	3	70
Parmelia conspersa	.	1	1	1	.	.	+	+	.	+	+	.	2	1	+	+	+	+	.	+	70
Hypogymnia physodes	.	+	+	1	.	.	+	1	1	+	.	+	+	1	+	+	.	+	+	.	70
Cladonia rangiformis	.	1	1	1	2	.	.	.	.	.	1	2	+	+	+	+	.	.	+	+	60
C. fimbriata	.	.	.	2	1	+	+	.	+	+	+	.	.	+	.	+	+	+	.	2	60
Ceratodon purpureus	2	1	+	1	.	.	2	1	.	+	1	.	1	.	.	+	.	.	.	2	55
Parmelia taractica	2	+	.	.	.	+	.	2	1	2	+	2	.	2	.	.	.	.	1	1	55
P. pulla	+	.	.	.	.	.	+	1	+	+	+	1	.	1	+	+	.	+	.	.	55
Polytrichum juniperinum	.	1	1	3	2	.	1	.	1	.	.	.	.	.	+	2	3	1	2	.	55
Diploschistes scruposus	+	.	.	.	.	.	+	.	.	1	.	+	+	1	+	+	.	.	+	+	50
Dicranum scoparium	.	.	.	1	2	.	.	1	2	.	.	1	2	1	1	.	1	.	.	.	45
Cladonia rangiferina	+	.	.	.	1	.	+	1	.	+	.	.	.	.	.	.	1	2	.	.	35
C. coniocraea	.	.	.	.	.	+	.	.	.	+	.	+	+	1	+	.	.	+	.	.	35
Rhizocarpon geographicum	+	.	+	.	.	.	+	.	.	.	.	+	.	+	.	.	.	.	.	.	25
Cladonia foliacea	.	+	+	.	2	.	.	.	.	.	.	1	+	.	.	.	.	.	.	.	25
C. furcata	.	.	.	.	.	+	.	.	1	.	.	.	.	.	+	.	.	.	1	1	25
C. pyxidata	1	.	1	.	.	.	.	.	.	.	.	1	.	.	.	.	.	+	.	.	20
C. squamosa	.	.	.	+	.	.	.	+	.	.	.	.	.	.	.	.	+	.	+	.	20
Candelariella vitellina	.	+	.	.	.	.	+	.	.	.	.	.	.	+	.	.	.	.	.	.	15
Bryum sp.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	1	.	.	1	.	15
Racomitrium canescens	+	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	10
Parmelia saxatilis	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	10
Cladonia polydactyla	.	+	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	10
Lasallia pustulata	.	.	.	.	.	.	+	.	.	.	+	.	.	.	.	.	.	.	.	.	10
Racomitrium heterostichum	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	+	.	10

Species present in one relevé only:

E3: Betula pendula /13: 1/, Fagus sylvatica /18: 2/;
E2: Corylus avellana /12: 2/, Tilia cordata /17: 2/;
E1: Berteroa incana /1: +/, Centaurea rhenana /1: +/, Echium vulgare /1: +/, Potentilla arenaria /1: +/, P. argentea /1: +/, Veronica dillenii /1: +/, Logfia arvensis /1: r/, Lapsana communis /2: +/, Robinia pseudacacia juv. /2: +/, Stellaria holostea /2: +/, Ligustrum vulgare juv. /4: +/, Euphrasia stricta /5: +/, Silene nutans /5: +/, Myosotis ramosissima /6: +/, Viola arvensis /6: +/, Campanula persicifolia /6: r/, Cotoneaster integerrimus /7: +/, Hieracium umbellatum /7: +/, Chondrilla juncea /9: +/, Silene otites /9: +/, S. vulgaris /9: +/, Berberis vulgaris juv. /10: +/, Helichrysum arenarium /12: +/, Arrhenatherum elatius /15: 1/, Fragaria vesca /15: 1/, Potentilla heptaphylla /15: +/, Scabiosa ochroleuca /15: +/, Carpinus betulus juv. /18: +/, Chamaecytisus ratisbonensis /18: +/, Genista germanica /18: +/, Rumex acetosella /18: +/;
EO: Cladonia subulata /2: +/, Parmelia caperata /2: +/, Dicranella heteromalla /5: +/, Plagiomnium affine /5: r/, Cladonia mitis /6: r/, Eurhynchium hians /6: +/, Lecidea fuscoatra /8: +/, Platismatia glauca /8: +/, Cladonia phyllophora /9: +/, Lecanora muralis /11: +/, Aspicilia gibbosa /12: +/, Parmelia loxodes /12: +/, P. sulcata /12: +/, Cladonia bacillaris /16: +/.

with potassium bichromate and sulphuric acid, the non-consumed $K_2Cr_2O_7$ was determined by the titration with Mohr's salt. The soil organic matter was calculated from the formula: organic matter (%)= $1.724 \times C_{ox}$ (%).

Natural conditions

The rivers flowing from the SE margin of the Bohemian Massif in the direction from WNW to ESE have created deep valleys with locally numerous meanders in a peneplain of the Znojemská pahorkatina hill country. Geological substratum is made of metamorphic rocks of the Moravian Moldanubicum (gneiss, granulite, locally amphibolites and serpentines), granodiorites of the Brunovistulicum occurring in the NE part of the investigated area, and granitoids and various metamorphic rocks of the Dyje Dome of Moravicum. Permo-Carboniferous conglomerates are represented in the area of the down-stream of the Rokytná river between the towns of Moravský Krumlov and Ivančice.

Climatologically, the investigated area falls into moderately warm (MT 11) and warm (T 2) regions (Quitt 1970). The average annual temperature from the period 1901-1950 is 8.8 °C (Ivančice, Znojmo) and 7.8 °C (Ketkovice). The average annual precipitation is 530 mm (Ivančice), 564 mm (Znojmo), and 577 mm (Ketkovice) (Vesecký et al. 1961).

Results

Nomenclature

The association name *Genisto-Quercetum petraeae* Zólyomi, Jakucs et Fekete ex Soó 1963 was first mentioned in the paper of Zólyomi et Jakucs (1957). Following units were subjointed to this association (Zólyomi et Jakucs l.c.): *"Luzulo-Quercetum Genista* Typ (Magyar 1934) Zólyomi et collab. 1954" and *"Luzulo-Quercetum* Fekete 1956". As the paper with the first publication of this name (Zólyomi et Jakucs l.c.) contains no relevé and no list of cited literature, the references to the earlier, actually published units are not bibliographically unambiguous and the name was not validly published. Only later Soó (1963) cited (by means of the reference to his previous paper Soó 1957) the papers with relevés (Magyar 1933, Fekete 1956) and validated the association name in this way.

Synmorphology

The tree layer of the *Genisto pilosae-Quercetum petraeae* is made of an oak stand with the average cover between 30-70 %. *Quercus petraea, Q. dalechampii, Q. polycarpa*, and hybrids of these species were recorded in relevés. These oaks are dwarfish with an average height between 4-10 m owing to an extreme habitat. *Loranthus europaeus* often occurs in their crowns. The scrub layer is usually lacking or consists, with the exception of juvenile oaks, of *Carpinus betulus* and *Tilia cordata*. The herb layer is characterized by the cover between 50-80 % and its pattern is determined by the distribution of the outcrops of rocks. It is dominated by *Festuca ovina* and *Genista pilosa* growing together with the species *Hieracium pilosella, Quercus petraea* s.l. juv., *Jasione montana, Rumex tenuifolius* and with a group of thermophilous species *Carex humilis, Linaria genistifolia, Festuca pallens, Hypericum perforatum, Steris viscaria*, and others. The average moss layer is variable: *Hypnum cupressiforme, Polytrichum piliferum, P. juniperinum, Ceratodon purpureus, Dicranum scoparium, Cladonia rangiformis, Cl. fibriata*, etc. on the ground among rocks and boulders, whereas epilithic lichens (*Parmelia taractica, P. conspersa, P. pilla, Hypogymnia physodes, Rhizocarpon geographicum, Diploschistes scruposus*, etc.) on bare rocks.

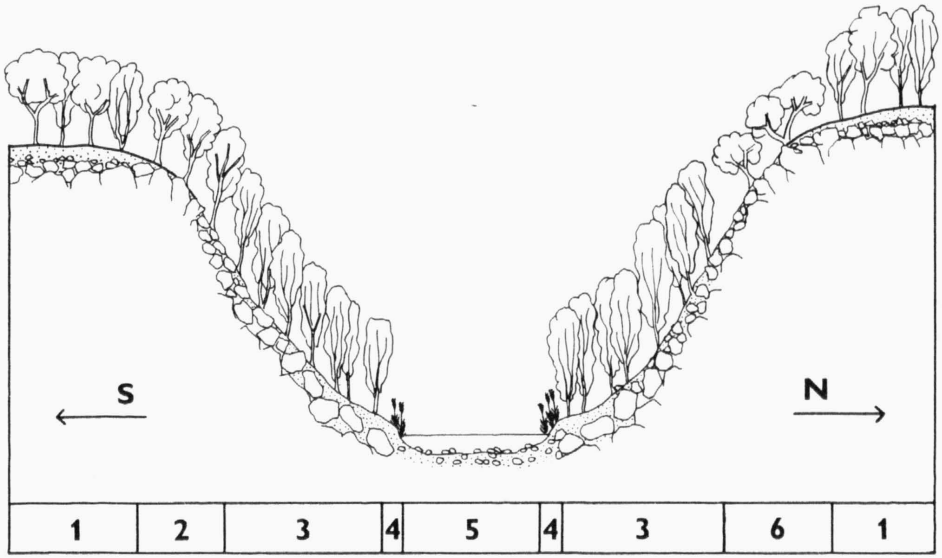

Fig. 1. - Sequence of vegetation types in a V-shaped river valley in south-western Moravia (1 - *Melampyro nemorosi-Carpinetum luzuletosum*, 2 - *Luzulo albidae-Quercetum typicum*, 3 - *Aceri-Carpinetum*, 4 - *Phalaridion arundinaceae* (fragments), 5 - *Batrachion fluitantis*, 6 - *Genisto pilosae-Quercetum petraeae*).

Synecology

The *Genisto pilosae-Quercetum petraeae* of the river valleys of south-western Moravia represents a vegetation on sunward margins of plateaus and upper parts of SE-W slopes (Fig. 1). The convex type of the relief accelerates denudation and that is why the soils are usually only 10-20 (-30) cm deep, gravelly rankers with transitions to oligotrophic brown soil. They have been developed on various siliceous rocks (gneiss, granulite, granitoids), only sporadically on Permo-Carboniferous conglomerates. The soils are strongly acid, pH (H_2O) 4.5-4.7 and pH (KCl) 3.6-3.7 were determined from five samples. $CaCO_3$ is entirely lacking or it is present only in traces. 3.3-7.5 % of organic matter was determined in the soils (Tab. 2). Such shallow soils dry up quickly on sunny southern slopes and as a result the dominating trees are usually dwarfish. Sunlight can penetrate through the open structure of the tree layer right to the ground where the xero-thermophilous herbs tolerating acid habitats can find acceptable conditions. The influence of dryness and warmth can be well observed by comparing this vegetation with that of the northern slopes (see below).

The *Genisto pilosae-Quercetum petraeae* is a primary edaphic conditioned community of the sunniest, warmest and driest habitats on rocky southern slopes of river valleys in the region under study. It is replaced only sporadically by stands with *Pinus sylvestris* on some rocks with almost undeveloped soil. Contact communities are usually *Melampyro nemorosi-Carpinetum luzuletosum* (Passarge 1953) Neuhäusl in Moravec et al. 1983 on

Table 2. - Some chemical properties of soils.

Relevé no.	Depth (cm)	pH(H_2O)	pH (KCl)	$CaCO_3$	C_{ox}	Organic matter (%)	Date (1988)
2	5-10	4.5	3.6	-	4.38	7.5	13 July
4	5-10	4.7	3.7	-	1.93	3.3	16 July
6	5-10	4.7	3.6	traces	3.90	6.7	25 July
8	10-20	4.5	3.6	traces	3.49	6.0	25 July
18	10-20	4.6	3.7	-	2.57	4.4	31 August

plateaus and *Aceri-Carpinetum* Klika 1941 on lower parts of slopes (Fig. 1). Habitats of the northern slopes corresponding to those of the *Genisto pilosae-Quercetum petraeae* are occupied by the more mesophilous *Luzulo albidae-Quercetum* (Hilitzer 1932) Passarge 1953.

Distribution in south-western Moravia

The community under study is distributed along the middle reaches of south western Moravian rivers in the territory of the phytogeographical districts Znojemsko-brněnská pahorkatina (Znojmo-Brno hill country) and Moravské podhůří Vysočiny (Moravian foothills of the Bohemian-Moravian Uplands) (Skalický 1988). It is spread in the Dyje valley near Znojmo, the Jevišovka valley near Vevčice, the Rokytná valley near Tavíkovice and Moravský Krumlov, the Jihlava valley from Kramolín to Biskoupky and the Oslava valley between Kladeruby and Čučice. Excluding the river valleys, the occurrence of the *Genisto pilosae-Quercetum petraeae* has been located only on slopes of a forest brook valley near Vedrovice on similar habitats to those of the river valleys (Fig. 2). Further findings can be expected in similar habitats in neighbouring areas of Austria (e.g. the Kamp valley).

Discussion

The association *Genisto pilosae-Quercetum petraeae* Zólyomi, Jakucs et Fekete ex Soó 1963 has been recorded and documented by phytosociological relevés especially from Hungary: the Velence Hills (Fekete 1956), the Pilis Hills (Horánszky 1964), the Mátra Mts. (Kovács 1975), and the Bükk Mts. (Magyar 1933). Similar stands are also known from the Zempléni Mts. (Simon 1977: 234). Comparing the relevés from these papers, we are able to find some differences among them. For instance, the materials of Fekete (1956) or Horánszky (1964) from the lower and warmer hill countries on the northern borders of the Pannonian Basin contain more xero-thermophilous species (*Buglossoides purpurocaerulea, Peucedanum cervaria, Sempervivum marmoreum, Melampyrum cristatum, Smyrnium perfoliatum, Euphorbia polychroma, Inula ensifolia, Fraxinus ornus, Achillea distans, Galium glaucum*, etc.) while these species are reduced in the relevés from the higher mountains (Mátra, Bükk). However, the absence of xero-thermophilous species may be caused by anthropogenous influences (e.g. grazing). The problem of variability of the xerophilous oak forests with *Genista pilosa* requires further investigations in the Hungarian Medium Range.

In accordance with species composition of the published relevés, Zólyomi et Jakucs (1957) and Soó (1963) incorporated this association in the alliance (Soó l.c.: subalLiance)

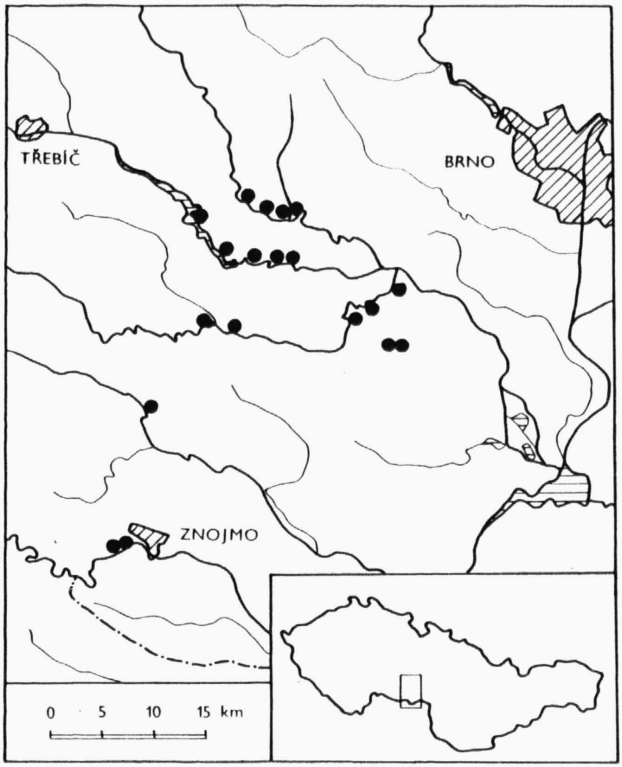

Fig. 2. - Distribution of localities of *Genisto pilosaea-Quercetum petraeae* in south-western Moravia.

Quercion petraeae Zólyomi et Jakucs 1957 (=*Quercion pubescenti-petraeae* Br.-Bl. 1931 p.p.). This conception was followed by other Hungarian authors. However, the phytosociological material from the Tříbeč Mountains in Slovakia, described by Husová (1967) as the *Genisto pilosae-Quercetum petraeae* Zólyomi, Jalucs et Fekete in Zólyomi et Jakucs 1957 comprised almost no species of xero-thermophilous oak forests and on the other hand it is characterized by a greater presence of acidophilous species and of those tolerating barren soils (*Vaccinium myrtillus, Calluna vulgaris, Deschampsia flexuosa, Hieracium lachenalii*, etc.). Consequently, the authors having studied this vegetation type in Slovakia (Husová 1967, Eliáš 1980, 1986, Mucina et Maglocký 1985, Michalko in Michalko, Berta et Magic 1986: 104) have included the *Genisto pilosae-Quercetum petraeae* in the alliance *Genisto germanicae-Quercion* Neuhäusl et Neuhäuslová-Novotná 1967 (or *Quercion robori-*

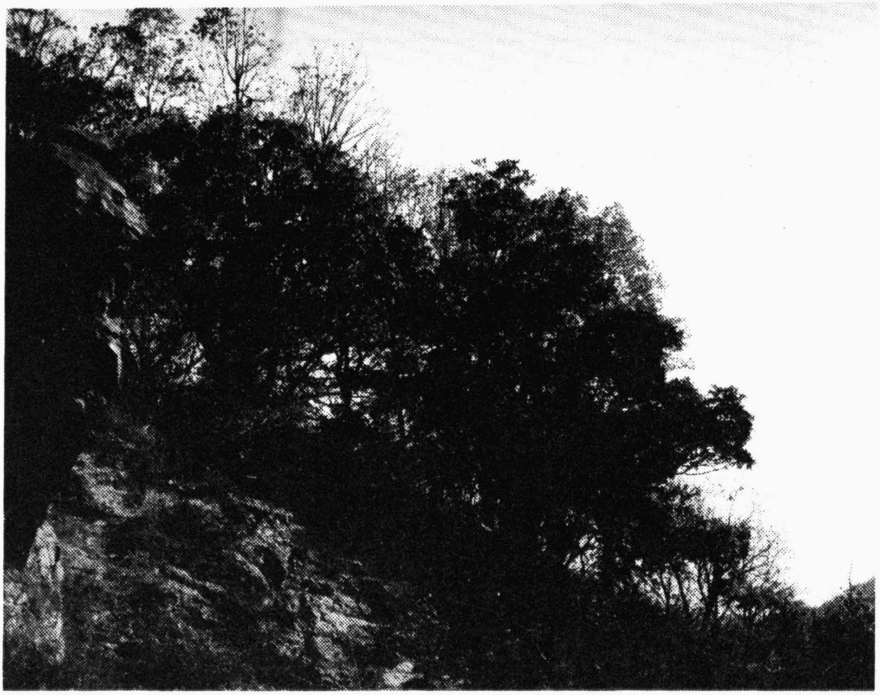

Fig. 3. - *Genisto pilosae-Quercetum petraeae* on slopes below the Ketkovský castle.

-petraeae Br.-Bl. 1932). Accordingly, the acidophilous oak forests with *Genista pilosa* in the Tríbeč Mountains are not identical with the *Genisto pilosae-Quercetum petraeae* Zólyomi, Jakucs et Fekete ex Soó 1963 (cf. Soó 1971: 164) due to the almost lacking thermophilous species in the stands of the Tríbeč Mts. The absence of these species is not conditioned only phytogeographically (Husová 1967 considers this vegetation a "western edge variant" of the *Genisto pilosae-Quercetum petraeae* with a considerable reduction of the *Quercion pubescenti-petraeae*-species) but especially by the strongly acid soils, extremly poor nutriments. Hence, it is necessary to separate the oak forests with *Genista pilosa* in the Tríbeč Mts. from the association *Genisto pilosae-Quercetum petraeae*. Definitive solution of the problem of syntaxonomical position of these communities will be possible only on the basis of a more extensive material comparison.

The south-western Moravian stands of the *Genisto pilosae-Quercetum petraeae* also show clear relations to the communities of subxero-thermophilous or acidophilous oak forests of poor habitats on rocky slopes which are distributed especially in the Bohemian Massif and in Germany. They are described there as *Cynancho-Quercetum* Passarge

Fig. 4. - The interior of a growth of *Genisto pilosae-Quercetum petraeae* near the castle of Ketkovice.

1957 and *Viscario-Quercetum* Stöcker 1965 (or *Cytiso-Quercetum* sensu Grüneberg et Schlüter 1957 non Pauca 1941) - their surveys were published by e.g. Hartmann et Jahn (1967), Schubert (1972), Neuhäusl et Neuhäuslová (1977). A differential species of the *Genisto pilosae-Quercetum petraeae* is *Genista pilosa* (often dominating the herb layer). In some stands of the *Cynancho-Quercetum*, there is a conspicuous presence of some *Carpinion*-species. The *Viscario-Quercetum* is characterized by poorer rocky soils and many thermophilous species are reduced in stands.

Note: In connection with the taxonomical study of the genus *Quercus* in Hungary and Czechoslovakia it has been revealed that the dominant species of some communities mentioned above is not only *Quercus petraea* (Mattuschka) Liebl. but also *Q. dalechampii* Ten. and *Q. polycarpa* Schur. Soó (1971) recorded *Q. dalechampii* and *Q. polycarpa* from the Hungarian stands of the *Genisto pilosae-Quercetum petraeae*. Michalko (1980) shows that *Q. dalechampii* is the leading species of the Slovakian *Genisto pilosae-Quercetum petraeae* (sensu Husová 1967 non Zólyomi, Jakucs et Fekete ex Soó 1963). *Quercus petraea, Q. dalechampii, Q. polycarpa*, and their hybrids *Q.* × *benkoi, Q.* × *sooi*, and *Q.* × *barnova* (determined by J. Koblížek) were found in Moravian *Genisto pilosae-Quercetum petraeae*, too.

Localities of relevés (Tab. 1)

1. Senorady, S slopes above the Oslava river around castle of Ketkovice 1.5 km N of the village, gneiss, alt. 320 m, plot 150 m^2, 20.7.1987.
2. Znojmo, SE slopes above the left bank of the dam 2 km SW of the town, granodiorite, alt. 250 m, plot 150 m^2, 13.7.1988.
3. Znojmo, SE slope above the left bank of the dam 2.5 km SW of the town, granodiorites, alt. 300 m, plot 150 m^2, 13.7.1988.
4. Moravský Krumlov, W slope of the Křížová hill above the Rokytná river on the NE border of the town, Permo-Carboniferous conglomerate, alt. 290 m, plot 150 m^2, 16.7.1988.
5. Rokytná, W slope above the right bank of the Rokytná river 1 km E of the village, Permo-Carboniferous conglomerate, alt. 270 m, plot 100 m^2, 16.7.1988.
6. - 7. Kramolín, S slopes of the Dřínová hill above the left bank of the Dalešice dam 2 km WNW of the village, gneiss, alt. 430 m, each plot 200 m^2, 25.7.1988.
8. Mohelno, S margin of the plateau above the left bank of the Mohelno dam 3 km W of the village, granulite, alt. 410 m, plot 150 m^2, 25.7.1988.
9. Mohelno, S slope above the camping site E of the road bridge to Dukovany 1.7 km ESE of the village, granulite, alt. 340 m, plot 150 m^2, 25.7.1988.
10. Lhánice, S slope above the left bank of the Jihlava river 1 km S of the village, granulite, alt. 340 m, plot 200 m^2, 25.7.1988.
11. Lhánice, S margin of the plateau above the left bank of the Jihlava river 1.5 km SE of the village, granulite, alt. 340 m, plot 100 m^2, 25.7.1988.
12. Vevčice, SW slope above the left bank of the Jevišovka river 0.6 km N of the village, gneiss, alt. 300 m, plot 150 m^2, 28.7.1988.
13. Vedrovice, W slope 0.3 km N of the gamekeeper's lodge 1.8 km NNE of the village, granodiorite, alt. 320 m, plot 200 m^2, 20.8.1988.
14. Vedrovice, S slope in a forest 2 km N of the village, granodiorite, alt. 330 m, plot 200 m^2, 20.8.1988.
15. Rešice, S slope above the left bank of the Rokytná river 1.5 km SSW of the village, gneiss, alt. 320 m, plot 200 m^2, 28.8.1988.
16. Tavíkovice, S slope above the left bank of the Rokytná river near Benda's mill 2.5 km NE of the village, gneiss, alt. 330 m, plot 150 m^2, 28.8.1988.
17. Ivančice, W slope above the right bank of the Rokytná river near the railway tunnel 2.5 km S of the town, granodiorite, alt. 270 m, plot 150 m^2, 29.8.1988.
18. Kladeruby n. Osl., S slope above week-end houses on the left bank of the Oslava river 1.5 km N of the village, granulite, alt. 320 m, plot 150 m^2, 31.8.1988.
19. Senorady, W slope above the left bank of the Oslava river 2.2 km NW of the village, granulite, alt. 340 m, plot 150 m^2, 31.8.1988.
20. Senorady, SW slope above the Chvojnice river mouth opposite to the castle of Ketkovice 1.4 km NNW of the village, granulite, alt. 360 m, plot 100 m^2, 31.8.1988.

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Summary

The paper contains the first record and phytosociological documentation of the occurrence of the association *Genisto pilosae-Quercetum petraeae* Zólyomi, Jakucs et Fekete ex Soó 1963 on the territory of the Czech Republik. This community occurs on sunny, rocky siliceous slopes in river valleys of south-western Moravia. It is formed by open stands of dwarfish oaks of the *Quercus petraea*-group, with characteristic occurrence of *Genista pilosa* accompanied by the group of xero-thermophytes and acidophytes. Syntaxonomical relations to the similar Central European communities are briefly discussed. It is evident that the oak forests with *Genista pilosa* of the Tříbeč Mountains in Slovakia, included in the association *Genisto pilosae-Quercetum petraeae* till now, lack thermophilous character and that is why they cannot be identified with this association.

Souhrn

V článku je poprvé zaznamenán a fytocenologicky doložen výskyt asociace *Genisto pilosae-Quercetum petraeae* Zólyomi, Jakucs et Fekete ex Soó 1963 na území České republiky. Toto společenstvo se vyskytuje na výslunných, skalnatých silikátových svazích v říčních údolích jihozápadní Moravy. Je tvořeno rozvolněnými porosty dubů ze skupiny *Quercus petraea*, v bylinném podrostu je charakteristický výskyt *Genista pilosa* doprovázené skupinou xerotermofytů a acidofytů. V práci jsou stručně diskutovány syntaxonomické vztahy k příbuzným středoevropským společenstvům. Je zřejmé, že doubravy s *Genista pilosa* v pohoří Tříbeč na Slovensku, dosud přiřazované k asociaci *Genisto pilosae-Quercetum petraeae*, nemají teplomilný charakter, a nemohou být proto s touto asociací ztotožňovány.

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