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Acidophytic Steppes in the Region of the Middle Vltava (Central Bohemia)

Acidofytní stepi ve středním Povltaví (střední Čechy)

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A b s t r a c t — In the region of the middle Vltava (the surroundings of Kamýk on Vltava) acidophytic steppes occur that may be characterized as secondary short-grass, discontinuous communities consisting of xerophytes, with a considerable participation of therophytes. They occur on sandy and loamy-sandy, moderately acid soils with a poor mineral component, which formed through weathering of eruptive rocks. The microclimate of their habitats resembles the conditions on blown sands. Its representative is the association *Artemisio (campestris)-Corynephoretum canescentis* as. nova, the systematic position of which within the order *Festuco-Sedetalia* Tx. 1951 is not quite clear and requires further study. The association is the first link of the successive line of grassland communities of acidophytic steppes. It probably arose after deforestation of the country and degradation of forest soils at the places of contact of specifically poor psammophytic vegetation with the xerothermic vegetation of the Vltava valley.

In the study of grassland communities in the terrain, attention was drawn to the ample occurrence of the suboceanic psammophyte *Corynephorus canecens.*[1]) Its locality in the Vltava valley was mentioned for the first time by Čelakovský (1885). Further known localities in the central Bohemian granite massif are near Štěchovice, Slapy, Čerčany, Sedlčany, Petrovice near Sedlčany, Příbram, and near Staré Sedlo (Rychnovská-Soudková 1959, Houfek in litt.). In the section of the river between Kamýk and Vestec, of a striking character is above all a massed occurrence of this species in ecologically extreme habitats, which had arisen after human interference. The amplitude of occurrence and in the terrain already at first sight visible considerable difference between communities with the predominating species *Corynephorus canescens* and the other pasture and meadow stands gave rise to a more detailed investigation.

In the Hercynic region short-grass discontinous communities on poorer sands with moderately acid reaction are very frequent.

In these communities there is a frequent participation of thermophilous elements of the class *Festuco-Brometea* and of the alliance *Festucion vallesiacae.* Very often these are the only habitats of thermophilous flora in the Hercynic region (Suza 1931, Domin 1903, 1924, 1926, 1943).

In regional floristic works the mentioned stands are described as "fescue fields", "grass formations of dry knolls and slopes", "grassy heath formations", "formations of coarse-grained granite sands" (Suza 1931), "open pastures", "barren pastures", "secondary xerophilous vegetation", "xerophilous communities" (Domin 1926), "communities of xerophilous and thermophilous plants", "xerophilous grassy slopes" (Domin 1924), and "formations of sands and sandy fallows" (Domin 1903).

[1]) The taxonomy of plants in this study used according to Dostál (1954).

They occur as secondary xerophilous communities of a pasture character on deforested hills, on dry, rocky slopes, on boundary ridges between fields, at the edges of forests, near paths, they grow on non-ploughed islands in fields, and form on sandy fallows. As a whole they may be characterized as short-grass communities consisting of xerophytes with ample participation of psammophytes, and comprising suboceanic, submediterranean, and also subcontinental elements. They are mostly not-confined coenoses with a richly developed ground floor of xerophilous mosses and lichens, and with a distinctive spring aspect of numerous therophytes. They occur on undeveloped, from psammitic to gravel soils with moderately acid reaction, which arose out of the decomposition of eruptive rocks (granite) or through weathering of sandstone. The existence of these, in our conditions mostly secondary, communities is conditioned first of all edaphically and microclimatically: the substratum is granular, aerated, it dries rapidly, its mineral component is small, it contains little humus, and in the surface layers there are high temperatures and intensive evaporation.

In the German literature there exist several terms for the mosaiclike spread stands of these extrazonal grassland communities with their developmental centre outside central Europe: "Grasheide" (MEUSEL 1940, p. 359, HOHENESTER 1960, p. 36) "Trockenrasen" (LIBBERT 1936, p. 23, MEUSEL l. c.), "Steppenschwingelfluren", and "Grasfluren" (MEUSEL 1940, pp. 425, 502). In the search for a suitable term for the denomination of these communities differing comparatively considerably by their specific composition and conditions of habitat from communities included generally in the term "pastures" (the alliance *Lolio-Cynosurion*), the most suitable name proved to be "acidophytic steppe".

Regarding the application of the term "steppe" in the Czech and Slovak literature an extensive discussion took place (PODPĚRA 1906, 1936, FUTÁK 1947, KLIKA 1948, 1955, LOŽEK 1949). It seems that we are still prevented from a broader application of the word "steppe" by the endeavour after a conformation of the notion "steppe" with the south-Russian steppe. In such a case there are actually many reasons (the problem of the origination of central-European steppes, soil type, macroclimatical pre-disposition, presence of different geoelements, climax character) preventing a broader application of this useful term. However, if we base our considerations first of all (as in the other formations) on the synmorphology of the community itself, we may, in conformity with DANSEREAU (1958) generally characterize a steppe as a graminoid, short-grass, discontinuous community consisting of xerophytes with a participation (spring aspect) of therophytes, and apply the term "steppe" also in a broader sense for the stands discussed here. According to the silicious substratum, it seems to be convenient to differenciate the used formation term "steppe" by the attribute "acidophytic". Thus, the synecological differences of these plant communities are expressed.

The communities of acidophytic steppes were studied in the middle Vltava in the neighbourhood of Kamýk on Vltava (area about 90 sq. km., see map) and in the neighbourhood of Živohošť. The axis of the investigated area is the river Vltava, an important factor in the modelling of the countryside, an old route of migration of many thermophilous and montane species. The river valley represents a variegated mosaic of habitats. The region is a component part of the central Bohemian hillcountry (altitude 260—500 m.) where, in the region of the granodiorites, the river valley is not canyonlike. In the valley between Kamýk and Zvírotice numerous river terraces have been formed. However, the moderately hilly relief of the area is rather variform at places, with milder or steeper slopes, and with relative differences of height up to 200 m.

The geological basis is the central Bohemian intrusive massif formed of different varieties of granodiorites and of quartz diorites of the Sázava and Vltava type. The massif is penetrated by vein varieties: aplites, pegmatites, lamprophyry, and vein diorites. The covering formations are formed of from psammitic to loamysandy soils of granite and other eruptive rocks. They are poor in minerals and form extensive slope and subslope deluvia subjested, after deforestation, to the erosive influence of water. At places there are islets of soils on loess and on loess loams.

Climatically the region belongs to the moderately warm and moderately moist region with a cold winter. The average annual temperature is 8° C, and the average annual total of precipitation is less than 600 mm. The effects of the rainshadow of the Brdy mountains are shown by the following values of precipitation (50 years' averages) measured at the nearest macroclimatic stations: Dobříš 534 mm., Kamýk 530 mm., Sedlčany 566 mm., and Staré Sedlo 583 mm. The vegetation

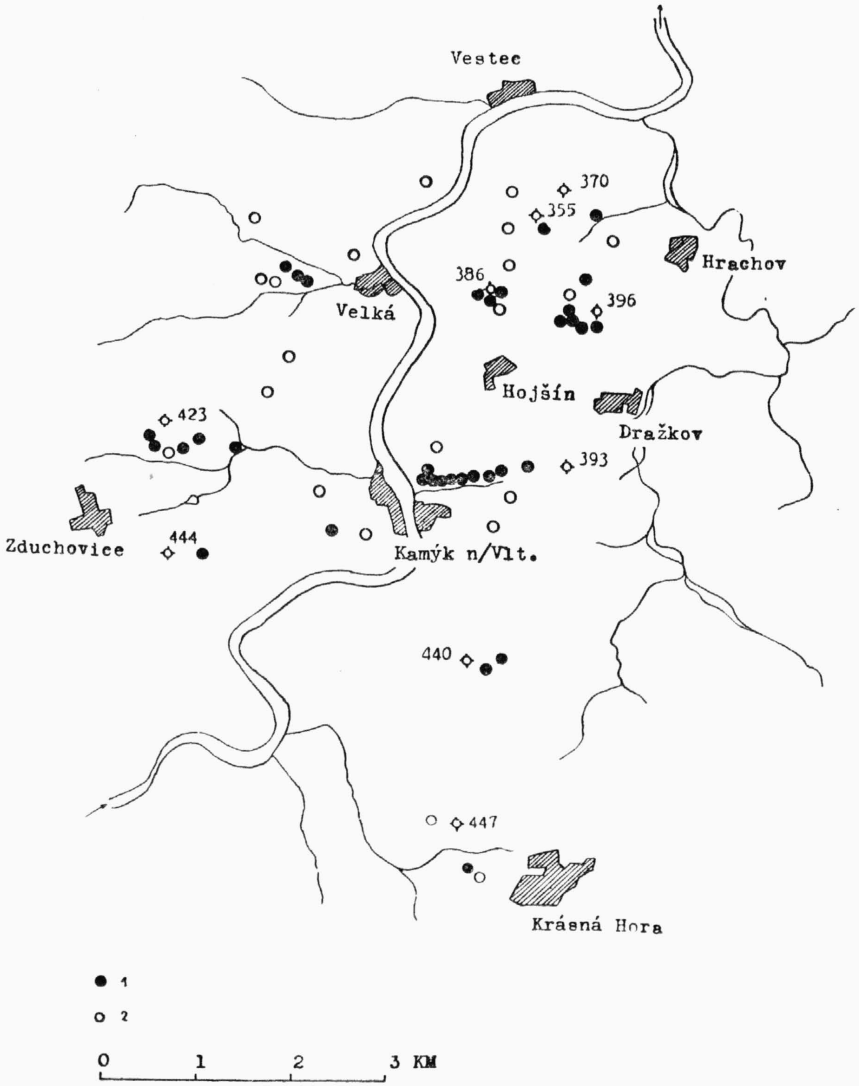

Fig. 1. — Distribution of acidophytic steppes in the area of the Middle Vltava; 1 — analysed stands, 2 — other observed stands.

period (April—September) participates in these values: Dobříš 353 mm., Kamýk 358 mm., Sedlčany 374 mm., and Staré Sedlo 374 mm. The geological and climatic data regarding this area have been obtained from material of the Central Geological Institute and of the State Institute od Hydrometeorology.

The specificity of the flora of the middle Vltava, the florogenetic importance of the valley, and the character differing from the Podbrdsko and from the Bohemian submontane region of the Bohemian-Moravian Highland are respected in all phytogeographical regional distributions. The area has been ranked in the territory of the thermophilous Hercynic flora, the district of the valleys of the Vltava and Sázava rivers, subdistrict of the middle Vltava (Dostál 1960). The diversity of the terrain and the resulting microclimatic mosaic, and the marked influence of the rainshadow of the Brdy mountains make possible the occurrence of numerous xerothermic species. Their localities are mentioned by Domin (1902), Kršková and Slavík (1958), and by Češka (1961).

According to the results of a reconstructional mapping, summarized in the prepared geobotanical map of the ČSSR, the forest stands most extensively spread prior to human interference were acidophytic oak-forests (*Quercetum medioeuropaeum*), and at altitudes of above 600 m. acidophytic beech-woods (*Luzulo-Fagion*). On the rocks of the Vltava valley there are preserved until today fragments of relict pine-forests, thermophilous oak-forests and oak-hornbeam forests (*Querceto-Carpinetum typicum*). The banks of the Vltava and also of other rivers are lined with communities of the alliance *Alno-Ulmion*. At the present time the territory has character of an intensively cultivated countryside (Hejný et Rosicky 1960), in which, with regard to area, field cultures and pastures predominate over forest stands. The anthropic influence is of old date: the wide open valley of the river was easily accessible to economic influences (cutting and rafting of timber, mining, numerous quarries), which limited the extent of the original forest stands and disturbed the biological equilibrium of the region. In areas of acidophytic oak forests there exist today insular secondary pine-woods with the predominating species *Festuca ovina* in the underwood. In the whole area there is a marked lack of foliagetrees. In recent years the vegetation of the Vltava valley has been influenced also by the extending of the road network, by the construction of the Kamýk waterworks, by the building of the primary grid of electric-power connections, and by the changing of the river valley into a widely frequented recreation area.

The mentioned ecological factors provide pre-conditions for the originating of dry, sunny habitats with a sandy substratum, which are inhabited by the communities of acidophytic steppes.

As the most significant community of acidophytic steppes in the vicinity of Kamýk may be typified the community

Artemisio (*campestris*)-*Corynephoretum canescentis* as. nova
[non *Corynephoretum canescentis* Tx. (1928) 1937]

The phytocoenological records contained in the table come from the following localities:

1, 2, 3, 5, 8, 10 — south-western slope of the height Šibený — 396 m., north-east of Hojšín; fragments of acidophytic steppes in pastures
4 — valley between Kamýk and Zduchovice, pastures at the confluence of streams by the road, east-south-east of the height 423 m.; terrain elavation
6 — southern slopes of the height 423 m., south-east of the village of Zduchovice; pastures
7 — southern slopes of the height 355 m. to the west of Hrachov; amidst pastures
9 — pastures east of the height Bába — 440 m., north-west of the settlement Žákovec near Krásná Hora
11, 16, 17, 18, 19 — Kamýk, right side bank of the Vltava, southern edge of forest in the direction of Kamýk—Hojšín; outcrops of rocks in pastures
12 — Kamýk, left bank of the river Vltava, pastures to the south of the ruins of Vrškamýk castle; outcropping rocks on roadside
13, 20, 22 — complex of pastures to the west of the Velká village, outcrops of rocks in pastures
14 — Kamýk, right bank of Vltava, to the west of the height Hejk — 393 m.; outcrops of rocks at edge of field
15 — south-eastern slopes of the height 444 m., south-east of Zduchovice; outcrops of rocks in pastures
21 — pastures to the east of the height Bába — 440 m., north-east of the settlement Žákovec near Krásná Hora, outcrops of rocks in pastures
23 — pastures north-west of Hrachov, south-east of the height Na Stakři 370 m.; outcrops of rocks

24 — west of Krásná Hora, south of the height 447 m.; unploughed islet in field
25, 28, 33 — southern slopes of the height 423 m.; north-east of Zduchovice, acidophytic steppes at the edges of pine-woods form a coherent belt
26, 29, 31, 32 — Kamýk, right bank of the Vltava, southern edge wooded ridge along Kamýk—Dražkov road; coherent belt along edge
27, 30, — southern slope of height 386 m. north of Hojšín, edges of pine-woods

Synmorphology

The association forms discontinuous, one-layer, short-grass grassland phytocoenoses. The free areas with coarsely psammitic substratum or with flat rock are covered with the thallus of the lichens *Cornicularia aculeata, Cladonia* sp. div., *Cetraria islandica,* with colonies of the mosses *Rhacomitrium canescens* and *Polytrichum piliferum,* and rarely with seedlings and small tussocks of *Corynephorus canescens.* The covering of the individual records fluctuates considerably (30—90 per cent), and, on the average, vegetation covers 60 per cent of the area. The average number of species in the records is 29 (range 9—37). The minimum-area of the community is 7—11 sq. m. The coenoses are formed almost exclusively by xerophytic species and comprise many psymmophytic species: *Corynephorus canescens, Scleranthus perennis, Trifolium arvense, Tunica prolifera, Aira caryophyllea, Filago arvensis, Jasione montans, Sedum boloniense,* etc. There is an absolute predominance of silicophytes over calcifytes. The dominant and edificator of the community is *Corynephorus canescens,* a species with high values of dominance and constancy. Next to it dominate *Thymus pulegioides, Festuca ovina, Artemisia campestris.* In the association predominate characteristic species of the order *Festuco-Sedetalia.* A larger participation of mesophytic species of the class *Molinio-Arrhenatheretea* appears only in records from pastures (in table marked as habitat 1). An important group in the community is represented by therophytic species, terminating their vegetation cycle before the period of summer drought: *Veronica dillenii, Trifolium arvense, Tunica prolifera, Trifolium campestre, Arenaria serpyllifolia, Aira caryophyllea,* and *Filago arvensis.* In records no. 13, 20, and 22 the homogeny of the stands was checked by means of small frequency plots (7 regularly placed plots of 40 × 40 cm.). The results obtained proved that also in the case of a great number of species in the record the stand is more or less homogenous. The smallest number of species is in the frequency class I, in higher classes (II and III) the number of species is high. Frequency class IV has a higher number of species than has class I.

The records in the table can be divided into three groups characterizing the following habitats: pastures, outcroppings of rocks, and edges of pine-forests. Habitat 1 "pastures" — records no. 1—10: small islets of stands of the association *Artemisio-Corynephoretum* on terrain elevations in pasture complexes. On an average, vegetation covers 80 per cent of the area; the average number of species in the records is 25 (range 24—32). Habitat 2 "outcrops of rocks" — records no. 11—24: vicinity of flat granite boulders and rocks in pastures, along paths and at edges of fields. Covering 50 per cent, average number of species 26 (20—37). This habitat is characterized by the species: *Pimpinella saxifraga, Agrostis tenuis, Asperula cynanchica, Cerastium arvense, Sedum boloniense, Calamintha acinos, Carex verna, Trifolium medium,* and *Veronica prostrata.* Among the species characterizing habitats 1 and 2 we may count: *Plantago lanceolata, Potentilla verna, Sedum acre, Scabiosa ochroleuca,* and *Koeleria pyramidata.* Habitat 3 "edges of pine-woods" — records no. 5—33: coherent belts of acidophytic steppes on the southern slopes of ridges and hills.

Characteristic species of the order *Festuco-Sedetalia*																																
Rumex acetosella	+	.	.	1.1	+	.	1.1	+	.	.	.	+	1.1	.	.	.	+	.	.	1.1	1.1	+	+	.	.	+	.	.	+	.	+	.	.	III
Veronica dillenii	.	.	.	.	.	—	.	—	.	.	.	+	+	.	—	.	.	.	+	+	—	+	.	+	.	.	—	+	.	+	.	.	.	II
Aira caryophyllea	.	.	.	—	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	I
Filago arvensis	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	—	.	.	.	.	.	.	.	—	.	.	I
Helichrysum arenarium	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	—	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	I
Herniaria glabra	.	+	.	.	.	+	.	.	—	.	.	.	.	.	.	.	.	.	.	.	.	.	—	—	.	—	.	.	.	.	.	.	.	I
Trifolium campestre	.	.	.	.	—	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	I
Companion species																																
Euphorbia cyparissias	.	+	1.1	1.1	—	1.1	.	1.1	—	+	+	1.1	3.1	1.1	+	1.1	1.1	1.1	1.1	1.1	+	1.1	+	1.1	1.1	1.1	1.1	+	+	.	+	1.1	.	V
Festuca ovina	1.2	2.2	+.2	1.2	1.2	2.2	1.2	.	2.2	1.2	—	.	2.2	2.2	+	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1 2	+	1 2	.	1.2	2.2	1.2	1.2	—	1.1	V
Hieracium pilosella	1.2	2.2	2.2	+	1.2	+.2	2.2	+	2.3	1.2	+.2	2.2	1.2	+	2.3	1.2	1.2	1.2	+.2	1.2	2.2	2.2	2.2	2.2	+	1.1	2.2	+	+	1.2	+	2.2	1.2	V
Poa pratensis s. l.	+	.	.	.	.	1.1	+	.	—	1.1	.	.	+	1.1	1.1	.	.	+	.	—	.	1.1	.	.	.	.	—	.	.	.	.	.	.	II
Achillea millefolium s. l.	1.1	1.1	+	+	1.1	+	+	+	.	.	.	+	.	.	+	.	.	.	.	+	+	+	+	.	.	.	.	.	.	.	.	.	.	III
Carlina vulgaris	+	+	+	.	—	.	+	.	+	.	+	1.1	.	—	+	.	.	.	.	.	.	.	.	.	.	.	+	—	.	—	.	.	.	III
Anthoxanthum odoratum	+	—	.	.	.	1.1	+	+	—	+	—	.	.	.	+	.	+	.	.	.	.	.	.	.	.	.	—	.	+	+	.	.	.	II
Hypericum perforatum	.	+	+	+	—	—	.	1.1	+	.	—	+	+	+	+	1.1	1.1	1.1	—	+	1.1	—	.	1.2	—	.	.	.	+	.	.	+	.	IV
Echium vulgare	.	.	.	.	.	—	.	.	.	.	+	.	.	.	—	1.1	1.1	+	.	.	.	.	.	.	.	—	.	.	.	.	.	.	.	I
Luzula multiflora*	.	.	.	.	.	.	.	.	.	.	.	.	1.2	.	.	.	.	.	.	1.2	.	1 2	.	.	.	.	.	.	.	.	.	.	.	I
Lotus corniculatus	.	.	.	+	.	.	.	.	.	.	+	+	+	.	.	.	.	1.2	.	1.2	.	.	+	.	.	.	.	+	.	+	.	.	+	II
Poa compressa	2.1	2.1	2.1	+	.	.	+	.	.	.	.	2.1	+	.	1.1	.	.	.	.	2.1	1.1	2.1	+	1.1	.	.	1.1	.	.	1.1	.	.	.	III
Sanguisorba minor	+	.	+	+	.	—	.	+	.	.	1.1	.	+	.	.	.	.	.	.	+	—	+	.	+	2.1	+	.	.	+	+	.	.	.	III
Anthyllis vulneraria s. l.	.	.	.	.	.	.	.	.	—	+	.	.	.	.	+	.	.	.	.	.	+	+	+	+	.	1.1	—	.	.	+	.	—	.	II
Chondrilla juncea	.	.	.	.	.	+	.	.	.	.	+	.	.	.	+	.	+	.	.	.	+	.	.	.	.	1.1	.	.	—	.	.	.	.	II
Coronilla varia	1.1	.	.	.	+	+	.	+	.	+	.	.	.	.	.	.	1.1	.	.	.	.	+	.	.	—	.	.	.	1.1	.	.	.	.	II
Erigeron acer	.	.	—	.	+	+	.	.	.	.	.	—	.	—	—	.	.	.	.	.	—	.	—	.	—	.	.	+	.	—	.	.	+	II
Pinus silvestris	.	.	.	.	—	.	.	.	.	.	.	.	.	—	.	.	.	.	.	.	.	.	.	.	.	—	—	.	—	+	.	.	+	II
Trifolium dubium	—	.	—	.	.	—	.	.	.	.	.	+	+	.	—	.	.	.	.	+	.	+	+	.	.	+	.	.	.	.	.	.	.	II
E_0 (cover in per cent)	5	10	5	20	5	10	5	20	5	5	10	20	15	10	15	10	10	10	20	10	20	15	10	20	10	20	20	20	15	20	20	10	10	
Ceratodon purpureus	.	—	.	.	.	.	.	+	.	.	.	.	+	.	.	.	—	.	+	+	+	+	.	+	.	.	.	.	+	.	.	+	+	II
Cetraria islandica	.	—	.	.	.	.	.	+	.	.	.	.	+	.	.	.	.	.	+	.	+	.	.	.	.	.	.	.	+	.	.	+	+	II
Cladonia sp.	.	.	.	+	.	.	.	.	.	.	+	.	+	.	.	.	.	.	+	+	.	+	.	.	.	+	+	+	+	+	.	.	.	II
Cornicularia aculeata	.	+	.	100**)	+	+	.	+	.	.	+	100	50	+	100	100	+	—	50	+	+	+	+	100	+	100	100	50	50	+	50	+	50	V
Hypnum cupressiforme	+	.	+	+	.	.	.	.	+	+	.	.	+	.	.	.	.	.	.	+	.	+	.	.	.	.	.	.	.	.	.	.	.	II
Peltigera canina	.	.	.	.	.	.	.	.	.	.	.	.	+	.	+	. .	.	.	.	+	.	.	.	.	.	.	.	+	.	.	.	.	.	I
Polytrichum piliferum	.	+	.	+	.	+	.	100	.	.	.	+	.	+	+	.	+	+	.	100	.	100	+	+	100	+	.	.	100	50	+	50	III
Rhacomitrium canescens	.	.	.	+	.	+	.	+	.	.	+	+	50	+	+	+	.	—	50	+	100	+	100	+	.	+	+	50	50	+	.	100	+	IV
Syntrichia subulata	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	I
Thudium abietinum	.	.	.	+	+	.	+	.	.	+	.	.	+	.	.	.	.	.	.	+	.	+	.	.	.	.	.	.	.	.	.	.	.	II

Constancy class I: *Alyssum calycinum* (13); *Apera spica-venti* (25); *Arenaria serpyllifolia* (15, 20); *Arrhenatherum elatius* (26,29); *Armeria elongata* (17); *Berteroa incana* (11, 24, 29); *Campanula rotundifolia* (10, 18, 24); *Centaurea jacea* (23); *Centaurea scabiosa* (16, 26); *Cerastium vulgatum* (2, 3); *Chrysanthemum leucanthemum* (14); *Convolvulus arvensis* (27); *Dactylis glomerata* (5, 8, 21); *Carlina vulgaris* (18); *Erigeron canadensis* (11, 14, 21, 27, 31); *Eryngium campestre* (1, 2, 3, 20, 22, 27); *Euphrasia rostkoviana* s. l. (9, 10, 15); *Festuca trachyphylla* (10, 13, 23); *Holcus lanatus* (7); *Hypochoeris radicata* (3, 7, 20, 21, 22); *Knautia arvensis* (10, 15); *Leontodon autumnalis* (21, 30); *Leontodon hispidus* s. l. (2, 7, 15, 23, 30); *Lepidium campestre* (25); *Luzula* vulgaris* (31); *Medicago minima* (13); *Phleum pratense* (2, 3, 11); *Polygonum aviculare* s. l. (9); *Potentilla arenaria* (31), *Rhinanthus alectorolophus* (5, 30); *Rosa* sp. (3, 16, 18, 30); *Pirus communis* s. l. (16); *Sarothamnus scoparius* (6, 12, 25, 28, 33); *Senecio vulgaris* (18); *Sieglingia decumbens* (20); *Silene nutans* (12, 16); *Trifolium alpestre* (19, 26, 32); *Trifolium pratense* (5, 9, 10, 22); *Trifolium repens* (20, 22, 30); *Turritis glabra* (5, 14); *Verbascum lychnitis* (16, 17, 26, 30, 32); *Galium verum* (17, 18); *Daucus carota* (14, 7).

* Estimated in symbols according to BRAUN-BLANQUET: first number combined estimation of abundance and dominance, second number estimation of sociability.

** Percentage cover of species in E_0 layer.

Artemisio (campestris)-Corynephoretum canescentis as. nova

	Habitat 1 "pastures"										Habitat 2 "outcrops of rocks"														Habitat 3 "edges of pine-woods"									
Number of stand examined	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	
Date	VIII. 1962	VIII. 1962	VIII. 1962	VIII. 1962	VIII. 1962	VIII. 1962	VIII. 1962	VIII. 1962	VIII. 1962	VIII. 1962	VIII. 1962	VIII. 1962	VII. 1962	VIII. 1962	VIII. 1962	VIII. 1961	VIII. 1961	VIII. 1961	VIII. 1962	VII. 1962	VIII. 1962	VII. 1962	VIII. 1962	VIII. 1962	VIII. 1962	VIII. 1962	VIII. 1962	VIII. 1962	VIII. 1962	VIII. 1962	VIII. 1962	VIII. 1962	VIII. 1962	
Exposure	SW	SW	SW	SE	SW	S	S	SW	—	—	S	—	SE	SW	SE	S	S	SW	S	SE	—	SE	SE	—	S	S	S	S	S	S	S	S	S	Constancy class
Inclination	9°	10°	10°	8°	8°	11°	10°	10°	—	—	16°	—	8°	12°	10°	10°	10°	8°	16°	8°	—	6°	12°	—	16°	18°	14°	15°	18°	12°	20°	15°	11°	
Cover of total area in per cent	70	80	90	50	80	80	80	60	75	80	60	60	50	70	80	70	65	65	80	40	50	50	30	45	50	40	50	60	60	50	40	30	30	
Area of record in m²	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	
E_1 (cover in per cent)	65	70	85	30	75	70	75	40	70	75	60	40	35	60	65	60	55	55	60	30	30	35	20	25	40	20	30	40	45	30	20	20	20	
Species of characteristic combination																																		
Corynephorus canescens	2.2*)	2.2	2.2	2.2	4.3	4.3	2.2	3.3	2.2	2.2	3.2	3.3	2.2	2.2	3.2	1.2	1.2	+	2.2	2.2	2.2	2.2	2.2	2.2	4.3	2.2	2.2	2.2	3.2	2.2	3.2	1.2	3.2	V
Artemisia campestris	2.2	1.2	2.2	1.2	2.2	1.2	2.3	2.2	1.2	1.2	2.2	2.2	2.2	2.2	1.2	1.2	1.2	2.2	1.2	2.2	+	2.2	1.1	1.2	1.2	2.2	1.1	1.1	1.2	1.1	1.2	.	1.1	V
Thymus pulegioides	1.2	+	1.2	1.2	1.2	3.2	.	+	2.3	1.2	2.3	2.2	2.2	2.3	3.3	1.3	1.3	2.3	+	3.2	.	3.2	1.2	1.3	1.2	2.2	.	2.2	1.2	1.1	2.2	2.2	.	V
Centaurea rhenana*	1.1	1.1	+	1.1	.	1.1	1.1	1.1	+	.	1.1	1.1	1.1	+	1.1	1.2	1.1	1.2	.	+	+	1.1	1.1	+	1.1	+	1.1	.	+	.	—	+	.	V
Jasione montana	1.1	1.1	1.1	.	1.1	2.1	1.1	2.1	1.1	1.1	.	1.1	.	+	1.1	1.1	1.2	1.1	1.1	1.1	1.2	1.1	.	+	1.1	1.1	1.1	1.1	1.1	1.1	+	1.1	1.1	V
Potentilla argentea	1.1	1.1	1.1	.	+	+	2.1	1.1	1.1	.	1.1	1.1	+	.	1.1	+	.	.	.	+	2.1	+	1.1	.	+	+	1.1	—	+	1.1	2.1	.	.	IV
Scleranthus perennis	+	+	+	.	.	1.2	.	.	1.2	1.1	.	+	+	+	2.2	.	.	+	.	2.2	1.1	2.2	1.1	.	+	+	+	+	.	+	.	+	.	IV
Dianthus carthusianorum	+	+	.	+	1.1	1.1	.	.	.	—	+	.	1.2	2.2	+	1.2	1.2	1.1	1.1	.	.	—	.	+	+	+	+	.	1.1	+	.	+	.	IV
Trifolium arvense	.	.	.	+	1.1	+	.	+	—	+	+	.	+	.	.	1.1	1.2	2.3	.	+	.	+	.	—	.	+	+	+	.	—	—	.	.	III
Species characteristic for habitats 1 and 2																																		
Plantago lanceolata	1.2	1.1	1.1	+	1.1	+	1.2	1.2	1.1	.	+	.	1.2	+	—	1.2	+	1.1	+	1.1	+.2	1.1	1.2	.	.	+	.	.	.	+	—	.	.	IV
Potentilla verna	+	+	+	2.2	+	+	2.2	+	.	+	2.2	+	2.2	1.2	.	2	1.2	1.2	2.2	3.2	—	2.1	2.2	1.2	+	1.1	.	.	+	.	+	.	.	IV
Sedum acre	1.2	1.2	1.2	+.2	2.3	1.2	.	1.1	.	.	.	.	1.2	.	+	.	.	.	.	1.2	+.2	1.2	1.2	.	+	.	.	.	.	—	.	.	.	III
Scabiosa ochroleuca	.	.	1.1	.	—	.	.	+	.	.	+	.	+	1.1	—	.	.	—	.	.	.	1.1	+	1.1	.	.	.	.	+	.	.	.	.	II
Koeleria pyramidata	.	.	.	1.2	.	.	.	.	.	.	.	.	.	.	.	.	1.2	.	.	.	.	.	.	1.2	.	.	.	.	.	.	.	.	.	I
Species characteristic for habitats 2																																		
Pimpinella saxifraga	.	.	.	+	+	.	.	—	.	.	.	+	.	1.1	1.2	1.1	1.2	1.2	+	.	.	.	.	1.1	.	+	.	.	.	.	.	+	.	III
Agrostis tenuis	.	.	.	+	.	.	1.2	+	—	+	.	.	.	.	.	1.2	2.2	2.2	.	1.2	.	+	+	.	.	.	.	.	.	+	.	.	.	II
Asperula cynanchica	.	.	.	+	.	+	.	.	.	.	.	.	1.1	2.1	.	1.2	+	1.1	.	.	.	.	.	.	.	+	.	.	.	.	.	1.1	.	II
Cerastium arvense	.	.	.	+	.	.	1.2	.	.	.	.	.	+	+	+	.	.	.	+	1.2	+	2.1	+	+	.	.	.	.	.	+	.	.	.	II
Sedum boloniense*	.	.	.	.	.	+	1.2	1.2	.	.	.	.	2.2	.	1.1	1.2	1.2	1.2	.	2.2	.	2.2	.	.	+	.	.	.	.	1.2	.	.	.	II
Calamintha acinos	.	.	.	.	.	—	.	.	.	.	.	.	1.1	.	.	1.2	.	1.1	.	+	.	.	.	.	—	.	.	.	.	.	.	.	.	I
Carex caryophyllea	.	.	.	.	.	—	.	.	.	1.2	.	.	+	+.2	.	.	2.2	1.2	2.2	.	.	.	.	.	.	.	.	.	.	.	.	.	.	I
Trifolium medium	.	.	.	.	.	.	.	.	.	.	.	.	2.2	.	.	1.1	1.1	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	I
Veronica prostrata	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	+	1.2	.	.	.	.	.	.	.	.	.	.	I
Species characteristic for habitats 2 and 3																																		
Phleum boehmeri	.	.	.	.	.	.	.	.	.	.	2.2	1.2	1.2	1.2	1.2	1.2	1.2	2.2	1.2	.	.	.	1.2	2.2	+	1.2	+	1.2	1.2	.	+	+	.	III
Sedum rupestre	.	+	1.2	+.2	.	—	+	.	1.2	.	.	+	2.2	+	.	2.2	1.2	1.1	+	1.2	+	+	.	+	+	+	+	.	1.1	1.2	+.2	1.2	.	IV
Tunica prolifera	1.1	.	1.1	.	+	.	.	.	.	.	1.1	1.1	.	.	1.1	.	.	.	.	1.1	.	1.1	1.1	.	+	+	+	.	.	+	—	+	.	III
Helianthemum nummularium	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	1.2	.	+	.	.	.	.	—	.	.	+	.	+	1.2	.	1.2	.	II

Covering 45 per cent, average number of species 22 (9—34). This habitat, together with habitat 2, is characterized by the occurence of the following species: *Phleum boehmeri, Sedum rupestre, Tunica prolifera,* and *Helianthemum nummularium.*

Synecology

Characteristic for the synecology of the community are the microclimatic and edaphic particularities of habitats of psammophytic vegetation, which were analyzed in the following works: KLIKA (1931), KRIPPELOVÁ et KRIPPEL (1956), and RYCHNOVSKÁ-SOUDKOVÁ (1959). The coarsely sandy soils on granite, the sloping terrain, and the as a rule southern exposure cause a permanent lack of water in the rhizosphere of the described association, and high temperatures of the soil surface and of the atmospheric layer next to the ground. The different character of these habitats compared with aeolian sands with a typically developed psammophytic vegetation may be observed in the immobility of the substratum and in the absence of condensed water in the soil, which latter is an important ecological factor for plants in aeolian sands in the summer period (KRIPPELOVÁ et KRIPPEL op. c.).

In the territory, stands of the association *Artemisio-Corynephoretum* occur in several types of habitats. First of all it forms conspicuous coherent belts on the southern, south-eastern, or south-western slopes of heights below pine-forests,which may be denoted as degradation stages of the association *Quercus petraea-Genista tinctoria* KLIKA 1932, most frequently as the sub-association *Querceto-Genistetum festucetosum ovinae* KLIKA 1958. They form also if the slope is more gentle and if the fields reach almost to the edge of the pine-forest. The profile of the southern slopes of hills and ridges (in an upwards direction) is expressed by the following scheme: fields or meadows → acidophytic steppes→ → forest. After deforestation a washing away of humus layers set in at these localities, and sterile soils, the debris of the ranker and podzolic soil types remained. The direct insolation causes a strong overheating of the surface, high temperatures in the lowest atmospheric layer, and intensive evaporation. Lack of moisture is caused also by rapid run off of precipitation and by the low capillary capacity of the sandy substratum. Cultivation of these habitats is difficult, the competition of the other species is decreased, and the mentioned extreme conditions make possible the development of psammophytic species. Their discontinuous stands produce very little plant material so that the increasing of humus in the soil and thus the settling of competitive plants is slow.

In the belts below pine-forests even the psammophytic vegetation suffers from the extreme drought. *Corynephorus* forms single tussocks, it flowers richly, but there are few sterile individuals and seedlings. In the dry year 1962 nanism was observed also in a number of xerophytes: *Asperula cynanchica, Hieracium pilosella, Trifolium arvense, Filago arvensis, Tunica prolifera, Rumex acetosella,* and *Poa compressa.*

On the northern slopes of pine-woods, acidophytic steppes are not developed. In close vicinity of the forest, in the root zone of pines, there usually is a narrow stripe almost without any vegetation or with individual specimens of the species *Hieracium pilosella* and *Festuca ovina* occurring in the underwood of the pine-forests. Then follow pastures with an ample participation of mesophytes. The profile of the soils is deeper, they are degraded soils of the podzolic type. The more favourable conditions of these localities for vegetation was shown

by a successful plating of *Quercus rubra, Carpinus betulus,* and *Lonicera xylosteum.*

The rhizosphere of the species *Corynephorus canescens* from an identical type of habitat (edges of pine-woods) in the neighbouring territory (Petrovice near Sedlčany) was examined in detail in RYCHNOVSKÁ's (1959, 1961) autecological study. The results obtained revealed the fact that with regard to their physical properties (total porosity, maximum water capacity, minimum air capacity, and granulation of fine earth) and with regard to the chemical composition of the soils (humus content, $CaCO_3$, pH) the habitats of the psammophytic vegetation of sandy soils resulting from decomposition of granite resemble habitats on blown sands.

The second locality of the occurrence of the association *Artemisio-Corynephoretum* are the terrain elevations and the immediate surroundings of flat granite boulders ("outcrops of rocks") amidst pasture complexes. The communities surrounding the phytocoenoses of our association have a high covering capacity. The species dominating in them are *Festuce ovina, Agrostis tenuis, Achillea millefolium, Lotus corniculatus, Trifolium repens,* and *Euphrasia rostkoviana.* On the territory in the south of the Sedlčany district MIKYŠKA (1929) denoted them as "*Festucetum*" in contradiction to the pasture communities "*Nardetum*" and "*Callunetum*". They are occasionally pastured and form fluent transitions to mesophytic meadows. In these may be observed a gradual enriching with species of the class *Molinio-Arrhenatheretea*: *Anthoxanthum odoratum, Arrhenatherum elatius, Holcus lanatus, Phleum pratense, Centaurea jacea, Cerastium vulgatum, Trifolium pratense,* and *Chrysanthemum leucanthemum.* The boundary between the association *Artemisio-Corynephoretum* and these pasture communities is sharply defined in the physiognomy of the stands, even if a mutual infiltration in the floristic composition of the coenoses sets in.

The third group of habitats of the association *Artemisio-Corynephoretum* in the region is found at localities that had been disturbed most by human activity: edges of forest paths, the neighbourhood of the building site of the Kamýk dam, the track of the pylons of the electric distribution network, and the sandy edges of fields and fallows.

Syngenetics

As up to the present time no more through observation of the succession cycle of acidophytic steppes has been carried out, I mention here only the results obtained in observations made in the years 1961 and 1962. As has already been stated, the association *Artemisio-Corynephoretum* settles in free localities with an insignificant depth of the soil profile. It has the character of a secondary community which, in the course of from two to three years, settles on sterile soil as a pioneer community, and after further years, after a sufficient accumulation of humus, it yields to the competitive pressure of mesophytic species. These changes are best seen in pasture complexes, where a gradual mutual infiltration of the floristic composition of neighbouring communities occurs. In the course of the first year single specimens of the species *Hieracium pilosella, Aira caryophyllea, Corynephorus canescens, Scleranthus perennis, Trifolium arvense,* and *Jasione montana* settle on the sterille soil. A larger occurrence of germinating plants of *Corynephorus canescens* and a developing of the groundfloor of mosses and lichens set in later.

In the first year a discontinuous community of therophytes forms at the sandy edges of fields, occuring in the territory predominantly as field weeds, and later missing in the developed stand of the association. The species concerned are: *Myosotis micrantha, Erophila verna, Arabidopsis thaliana, Spergula arvensis, Spergularia rubra, Myosotis hispida,* and *Gypsophila muralis.* Sometimes *Filago arvensis* predominates in the stand. In the second year seedlings of *Corynephorus canescens* appear.

The results of the observations show that the relatively most constant habitats of the association *Artemisio-Corynephoretum* in the region are the edges of pine monocultures on slopes with a southern exposure, which fact is obviously connected with the microclimatic particularities of the forest edges exposed to sunshine, where air-drainage is decreased.

Synchorology

The attached map shows the best developed stands of the association *Artemisio-Corynephoretum,* which are concentrated in the neighbourhood of Kamýk on Vltava. In late summer its distribution in the country may be followed according to the silvery colour of the tussocks of the dominating plant *Corynephorus canescens.* An occurrence of the described association may be expected, as has been shown by the work of KRŠKOVÁ and SLAVÍK (1958), also in other sectors of the middle Vltava, further on weathered granite in the foot-hills of the Bohemian-Moravian Highland, in the foot-hills of the Šumava, and in further parts of the central-Bohemian granite massif.

Association with a similar floristic composition exist in western Bohemia near Klatovy (SKALICKÝ in litt.): the dominant *Corynephorus canescens* is not missing, of the other species are named *Trifolium arvense, Jasione montana, Phleum boehmeri, Aira caryophyllea, Hieracium pilosella, Sedum boloniense, Alyssum calycinum, Filago minima, Scleranthus perennis, Plantago lanceolata, Herniaria glabra, Vulpia myurus* (SKALICKÝ in litt.). The results of phytogeographical studies and reconstructional mapping of the communities of western Bohemia show a striking concentration of important species of the order *Festuco-Sedetalia* in the territory of the upper flow of the river Střela. Mapped were the following species (MLADÝ in litt.): *Potentilla argentea, Scleranthus perennis, Sedum acre, Sedum rupestre, Trifolium arvense, Dianthus deltoides,* etc. Further, of the class *Festuco-Brometea* there is an ample occurrence of species: *Artemisia campestris, Calamintha acinos, Carlina vulgaris, Cerastium arvense, Euphorbia cyparissias,* and *Phleum boehmeri.* As belonging to the discussed community might be considered also the hitherto not analyzed stands of psammophytic vegetation on neogenic sands and gravels in the districts of Žatec (Holedeček, Svojetín, the Zlatník hill) and of Podbořany (Kryry, Vroutek), and on sandstones in the Bilichov valley and near Hvězda to the west of Slaný (MLADÝ in litt.).

In Czechoslovakia and in Poland the original foci of psammophytic vegetation on sandy alluvia of rivers obviously were clearings in poor pine-woods (KLIKA 1931, KORNAŚ 1957), from which the heliophilous psammophytic vegetation spread to secondary habitats. There is no doubt that the primary habitat of the xerothermic and psammophytic species of acidophytic steppes in the middle Vltava was the valley of the river, where the mentioned species are significantly represented on rocky slopes and ridges (KRŠKOVÁ et SLAVÍK op. c., ČEŠKA op. c.). Not even *Corynephorus canescens* avoids a rocky substratum. Its habitats are known from central Germany on the porphyry rocks of the valley of the Saale (MEUSEL 1940). In the neighbourhood of Kamýk on Vltava its occurrence was observed on granite rocks below the Patěková height to the south of Vestec, where, in the association *Festuca glauca-Seseli osseum* KLIKA (1933) 1939, it dominates together with the species *Festuca glauca* and *Stipa joannis.*

Classification of the community

From literary data it can be seen that under the conditions of central Europe there exist two types of mutually close communities, which settle on poor psammitic soils. They are the sub-Atlantic pioneer communities of the type *Corynephoretum canescentis* Tx. (1928) 1937 growing on littoral and inland sand dunes and described in the works of Tüxen (1937, 1958), Steffen (1931), Libbert (1936), Kornaś (1957), Oberdorfer (1957), Hohenester (1960), Fukarek (1961), and Vicherek (1962), and secondary communities with elements of the continental type *Festuca ovina-Thymus angustifolius* Tx. (1928) 1937, described by Tüxen (1937), Libbert (op. c.), Bartsch J. et Bartsch M. (1940), Kornaś (op. c.), and Oberdorfer (op. c.). Regarding the ranking of these two groups of communities in higher phytocoenological units there exist several conceptions, which were summarized by Kornaś (op. c.).Substantially we can see two tendencies; common inclusion of both types in the order *Corynephoretalia* Tx. 1933 (Tüxen 1937) in the class *Corynephoretea* Br. Bl. et Tx. 1943 (Tüxen 1955), and in the alliance *Corynephorion* Klika 1931 (Tüxen 1937, Klika 1931, 1948, 1955). In the second case, i.e. the dividing of both types, in which case the communities of the type *Corynephoretum* form the alliance *Corynephorion* Klika 1931, the communities of the type *Festuceto-Thymetum* are ranked in the alliance *Thero-Airion* Tx. 1951; both alliances belong to the order *Festuco-Sedetalia* Tx. 1951 (Oberdorfer op. c.). In a recent discussion on the system of the plant communities of western and central Europe (Matuszkiewicz 1962) the lack of uniformity of views regarding the ranking of just these xerophytic and psammophytic communities was shown again. It will be possible to solve this problem, as pointed out by Kornaś (op.c.), after a sufficient quantity of factual material has been collected from the whole of central Europe. In this study the conception of the classification of psammophytic communities according to Oberdorfer (1957) was adhered to.

In some territories both types of psammophytic communities (the sub-Oceanic *Corynephoretum* and also the subcontinental *Festuceto-Thymetum*) exist parallelly. In southern Poland this fact was ascertained by Kornaś (op. c.), and in the northern foot-hills of the Harz by Libbert (op. c.). In the middle Vltava only one community was found, described here as *Artemisio* (*campestris*)-*Corynephoretum canescentis*, which, in the settling on sterile soils, forms the first link of a successive line. Its floristic composition and the character of its habitats prove that it belongs to the order *Festuco-Sedetalia* Tx. 1951. However, in spite of the sufficient number of records, and after comparison with published tables of related communities (cf. Tüxen 1937, Kornaś 1957, Oberdorfer 1957), it is very difficult to reach any decision regarding its further systematic classification within the frame of the mentioned order. Many reasons speak against its outright classification either with the alliances *Corynephorion* Klika 1931 or *Thero-Airion* Tx. 1951. This is above all the absence of a group of species of sub-Oceanic elements, which do not lack in the floristic structure of typically developed *Corynephoretum* and, on the contrary, they show, as can be seen from the works of Tüxen (op. div.), Libbert (1932), Filipek (1955), and Kornaś, a high constancy. The species concerned are *Aira caryophyllea, Carex arenaria, Teesdalia nudicaulis, Myosotis discolor, Ornithopus perpusilus,* and *Spergula vernalis.* The habitats of our association are sandy soils on granites; apart from the original description of *Corynephoretum* by Braun-Blanquet from France (Rychnovská-Soudková 1959) psammo-

phytic communities of the type *Corynephoretum* have not been mentioned on similar substrarum. The phytocoenoses of *Artemisio-Corynephoretum* are homogenous. KORNAŚ emphasized the heterogenity of stands of *Corynephoretum* in southern Poland. With the small extent of the minimum-area, the great proportion of mosses and lichens in the groundfloor, and with its small cover, the described community conforms with the optimum stages of the association *Corynephoretum canescentis* Tx. (1928) 1937 analyzed by KORNAŚ. On the other hand, the richer floristic composition and the larger presence of species typical for xerothermic grass communities of the class *Festuco-Brometea*, of the alliance *Festucion vallesiacae*, and of the alliance *Bromion*, prove its relationship with provisory taxon *Festuceto-Thymetum* of KORNAŚ. Nevertheless, the dominant and edificator of the described community is *Corynephorus canescens*. *Thymus pulegioides* has not such high values of dominance and does not form an expressive aspect. A constant species of the association is *Artemisia campestris*, which occurs only rarely in communities of the type *Festuceto-Thymetum* (cf. TÜXEN 1937, KORNAŚ 1957, OBERDORFER 1957). An important specific combination is formed, besides by others, by the species *Centaurea* rhenana*, *Dianthus carthusianorum*, *Phleum boehmeri*, *Tunica prolifera*, *Sanguisorba minor*, and *Scabiosa ochroleuca*, altogether species of the subcontinental element, which do not appear in the records of the hitherto described communities of the type *Festuceto-Thymetum*. Unlike the association *Festuceto-Thymetum* KORNAŚ 1957 this association does not arise as a further succesive stage on grazed up pastures, but it is in itself a pioneer community commencing a successive cycle on sterile soils.

On the basis of the different floristic composition of some records of the association *Festuceto-Thymetum* KORNAŚ expresses the view that stands rich in calciphilous species of the class *Festuco-Brometea* are not transitional successive types, but that they form at places of contact between psammophytic and xerothermic communities, e.g. at the foot of the Jurassic limestone hills. In the region of the middle Vltava a similar contact of psammophytic and xerothermic vegetation may have occurred in consequence of the immediate proximity of the river valley, which was a reservoir of thermophilous species, and because of the existence of sandy soils, which formed, after the deforestation of the country, through degradation of the original forest soils. Obviously the result of this process are the stands of the association *Artemisio-Corynephoretum* amply spread in the area today.

Filagini-Vulpietum OBERD. 1938

is the second community of the order *Festuco-Sedetalia* Tx. 1951, occuring in the middle Vltava. It characterizes fragments of acidophytic steppes of the neighbourhood of Živohošť. Before the forming of the lake of the Slapy riverdam the Vltava ran in this region through a deep, canyonlike valley. The geological substratum consists of metamorphic slates and of conrnstone (rocks of the Jílové zone), which are rather resistant to weathering. In the river valley and in close proximity there are plenty of natural forest stands. Their occurrence is connected with the mineral strength of the geological substratum and with the unfavourable influence of the changeful relief, which prevented a more penetrating human intervention in the area. Deforestation is of a more recent date than is the case in the neighbourhood of Kamýk on Vltava, and the extent of agricultural cultures and pastures is smaller. In the physiognomy of the

country acidophytic steppes are not a prominent feature. We find them at the edges of pine monocultures and on light sandy soils with a small proportion of loam. Their structure is illustrated by the following phytocoenological record:

Section of the middle Vltava near the village of Křeničná, edge of pine-forest to the north of the village, altitude 430 m., southern exposure, degree of slope 6°, cover 30 per cent. E_1: *Filago arvensis* 2.1, *Vulpia myurus* 1.1, *Sedum rupestre* 1.2, *Filago germanica* +, *Filago minima* +, *Aira caryophyllea* +, *Poa compressa* 1.1, *Ventenata dubia* +, *Euphrasia stricta* +, *Dianthus deltoides* +, *Festuca ovina* 1.2, *Hieracium pilosella* 1.1, *Rumex acetosella* +, *Jasione montana* +, *Plantago lanceolata* +, *Agrostis tenuis* +, *Trifolium arvense* +, *Scleranthus perennis* 1.2. E_0: *Cornicularia aculeata* 1.1, *Cetraria islandica* +, and *Polytrichum piliferum* +.

The community has not been further analyzed thoroughly. Its fragments were found in forest clearings where afforestation work was carried out resulting in a temporary baring of soil, at edges of paths, on deforested slopes above roads, and on heaps of sand at the building site of a new bridge at Živohošť. In the phytocoenoses at these habitats there is usually a considerable admixture of species of weed and ruderal communities.

The association *Artemisio* (*campestris*)-*Corynephoretum canescentis* does not occur in this sector of the Vltava valley. Besides at the known locality to the north from here near Štěchovice and Slapy, no further occurrence of the species *Corynephorus canescens* has been observed.

Souhrn

V území střední Vltavy (okolí Kamýka nad Vltavou) se vyskytují acidofytní stepi, které lze charakterisovat jako sekundární travinná, krátkostébelná, nezapojená společenstva budovaná xerofyty, se značnou účastí terofyt. Vyskytují se na písčitých a hlinitopísčitých, minerálně slabých, slabě kyselých půdách, které vznikají rozpadem hlubinných vyvřelin. Mikroklima jejich stanovišť se podobá poměrům na vátých píscích. Jejich representantem je asociace *Artemisio* (*campestris*)-*Corynephoretum canescentis* as. nova, jejíž systematické postavení uvnitř řádu *Festuco-Sedetalia* Tx. 1951 není zcela jasné a vyžaduje dalšího studia. Asociace představuje první článek sukcesní řady travinných společenstev acidophytních stepí. Vznikla pravděpodobně po odlesnění krajiny a degradaci lesních půd na místech styku druhově chudé psammofytní vegetace s xerothermní vegetací Vltavského údolí. Jejím relativně nejtrvalejším stanovištěm v území Kamýka nad Vltavou jsou jižní okraje borových monokultur.

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