

## **Vegetation, microtopography and water table in the Lužnice River floodplain, South Bohemia, Czechoslovakia**

**Vztahy mezi vegetací, mikroreliéfem a hladinou vody v nivě řeky Lužnice**

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Prach K. (1992): Vegetation, microtopography and water table in the Lužnice River floodplain, South Bohemia, Czechoslovakia. - *Preslia, Praha, 64: 357-367.*

**Key words:** Vegetation pattern, river floodplain, moisture gradient, management

Relations between vegetation, elevation of topographic surface, and water table were studied along a cross-section transect in a representative part of the floodplain of the Lužnice River in the Třeboň Biosphere Reserve. The coenocline from aquatic macrophyte communities to mesic meadows was found in only 1.5 m range of elevation. Elevation could be used as the good measure of moisture gradient because of readily drained sediment; an exception being sites at terraces influenced by seepage. The information provided by this study is also used for recommendation of management practices for the floodplain.

### **Introduction**

The floodplain of the Lužnice River (Fig. 1) has been subjected to intensive ecological investigation under the MAB/Unesco programme "The Třeboň Project - Role of wetlands in the Temperate Forest Biome" (Jeník et Prach, 1988). A particular research is concentrated on "Productivity and nutrient balance in the Lužnice River floodplain" and for its completion it was necessary to describe vegetation pattern and environmental factors in the segment under study. The results seem to demonstrate more general relations between basic environmental factors, vegetation, and land use in floodplains. They can also be exploited in preservation and restoration of alluvial meadows.

During the last six centuries, natural vegetation in the floodplain, consisting of wet mixed woods and alder/willow carrs, was mostly transformed into regularly cut meadows and marshes. Over the past four decades, the less accessible meadows were abandoned. Recently, the whole floodplain has undergone dynamic processes of ruderalization, enhanced by anthropogenic eutrophication and by the cessation of regular management.

Vegetation pattern and land use were described along transects down the Lužnice River (Prach et al. 1990). This paper evaluated the vegetation pattern in finer scale along one of the cross-section transects. Preliminary results were published in Prach et al. (1988).

Three essential river-induced gradients are often markedly expressed in a river floodplain: (1) moisture gradient; (2) nutrient gradient; and (3) gradient of disturbance intensity (Day et al. 1988). Individual plant species and vegetation units serve as good indicators of the combination of all these gradients. However, in a floodplain, the importance of the factors in forming vegetation pattern can vary in great deal. Because of the easily permeable sediments occurring in the studied floodplain segment it could be expected that the moisture gradient was the most responsible for

the observed vegetation pattern. However, the two others cannot be excluded. Vegetation response to the gradients, expected according to previous field experiences, is shown in Fig. 2. The poorly empirical figure requires a sound verification and quantification of space and temporal scales. It can serve only as a conceptual base for our general understanding of vegetation pattern and dynamics in the floodplain, for designation of more detailed observations and experiments, and as a background for preservation/restoration activities. Relationships between vegetation and water table are examined in detail below. The role of nutrient supply is currently under being investigated, and experiments are under progress testing the influence of disturbance on the vegetation.

The following particular questions are predominantly addressed in this paper:

(1) How important is the moisture gradient for vegetation pattern in the studied floodplain segment compared with other environmental gradients?

(2) How does vegetation respond to the gradient?

(3) Can the moisture gradients simply be expressed by elevation?

### Study area and methods used

The Lužnice river originates in the Austrian part of the Novohradské hory Hills (Freiwald) at 990 m a. s. l. After flowing about 40 km in solid bedrock of an upland

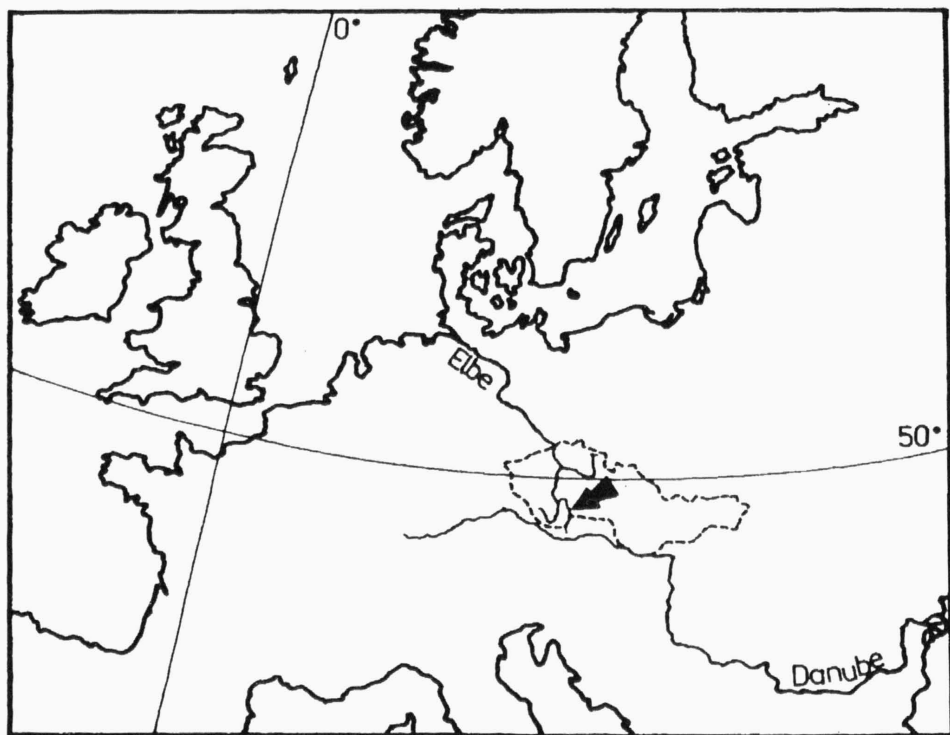


Fig. 1. - Location of the study area in Central Europe.

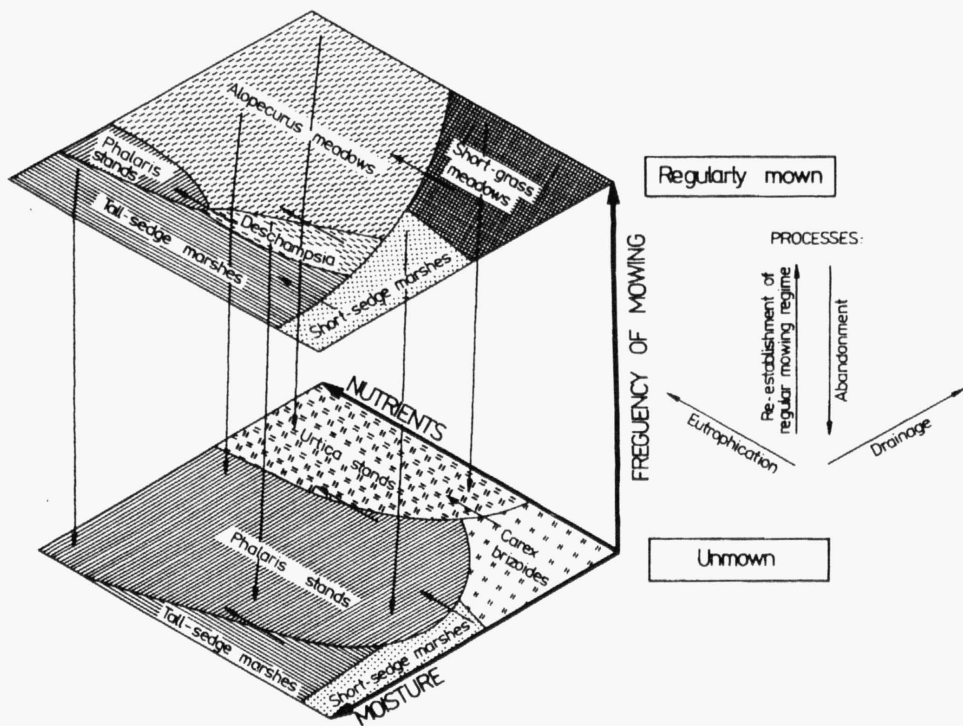


Fig. 2. - Empirical scheme of vegetation pattern in the Lužnice river floodplain in relation to main environmental factors: moisture (evaluated in this paper), nutrients (quantification in progress), and frequency of mowing (partly considered in this paper, experiments under progress). All factors increase in their amount or intensity along the axes. The most frequent recent successional changes are depicted in the figure by arrows; inclination of the vertical arrows indicates the expected increase of nutrients and stand moisture after the abandonment of regularly mown meadows.

landscape, the river enters a flat sedimentary area of the Třeboň Basin, creating a meandering section. After 200 km it empties into the Vltava river at 350 m altitude. Its drainage area amounts 4,225 km<sup>2</sup>. The floodplain segment which is dealt in this paper is located at the 137.5 stream kilometre measured from the mouth, at 456 m altitude, 48° 51' latitude, 14° 55' longitude. It represents one of the most typical grassland parts of the floodplain in the Třeboň Biosphere Reserve (Prach et al. 1990).

A linear transect, 350 m in length was fixed across the floodplain. The topographic surface was surveyed to obtain exact data on the elevation at each 1 m interval along the transect.

Basic vegetation units were distinguished considering dominant species and physiognomy of stands. Their pattern was mapped in the 50m width strip along the transect. Phytosociological relevés were noted in each 1m<sup>2</sup> plot along the transect in June/July 1986. Cover degrees for each species present in the plots were visually estimated in percentages. Species names follow Ehrendorfer (1973). The relevés were classified into the vegetation units. Mean elevation and mean position of water table were expressed for

each unit on the basis of the data characterizing 1m<sup>2</sup> plots.

Between November 1986 and November 1988, i.e., in the hydrological years 1987 and 1988, position of water table was measured at two week intervals in 13 bore-holes situated along the right part of the transect from the river-bed to the top of the terrace. (Usually only the right part of the transect, i.e. the part from the river to the terrace on the right hand looking downstream, is presented in the figures.) Based on these measurements, correlations between the discharge and water table in the bore-holes were calculated and results related to elevation. It enabled to estimate the position of water table along the transect including the long-term average. Water discharge was measured by standard methods by the Hydrometeorological Institute, České Budějovice. The area covered by different flood waters was mapped over the same strip where vegetation was mapped.

On the basis of phytosociological relevés, presence of vascular plant species and mean percentage cover of selected dominant species were expressed for each elevation category rounded to 0.1 m, excluding the plots at the foot of terraces where the water table was evidently influenced by seepage.

Species diversity for each sampling plot was calculated from the cover data using the Shannon's formula with binary logarithms (Whittaker 1972).

Untransformed cover data of all phytosociological relevés were processed by the ordination technique of the Detrended Correspondence Analysis (DCA - Hill 1979).

## Results

The topographic surface and positions of water table along the transect are shown in Fig. 3. The ready response of water table in the most floodplain area to the discharge because of the rapid drainage in sand and small-sized gravel sediments prevailing in the soil can easily be seen. For this reason, elevation could be used as a simple measure of the site moisture conditions in this floodplain segment except the sites near the terraces. The correlations between water discharge, elevation, and position of water table are shown in Table 1 where the vegetation units are listed according to the increasing elevation of their occurrence. Despite the small total range of elevation recorded along the transect, the differences between the occurrence of units are often significant. Correlations between

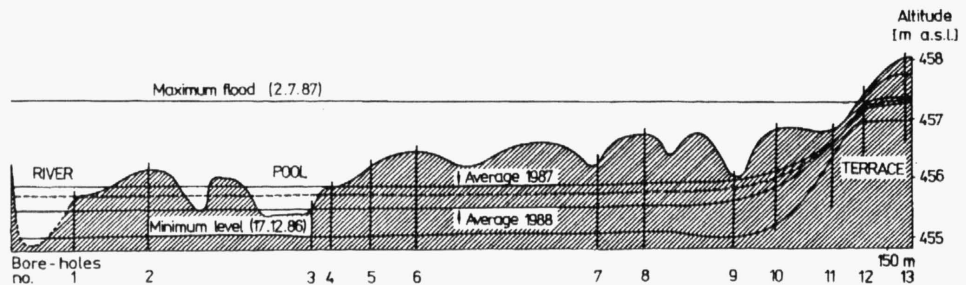


Fig. 3. - The part of the transect across the Lužnice river floodplain. Extreme and mean values of water table recorded in the studied period are depicted together with the estimated long-term average of the water table (dashed line). Positions of bore-holes are marked by the vertical lines.



Fig. 4. - The part of vegetation map along the transect (a), in comparison with different levels of floods mapped in the same strip (b). Explanations: (a) 1 - *Alopecurus pratensis* meadows; 2 - short-grass meadows; 3 - *Deschampsia cespitosa* meadows; 4 - *Phalaris arundinacea* stands; 5 - *Urtica dioica* stands; 6 - *Carex gracilis* stands; 7 - *Carex vesicaria* stand; 8 - *Rorippa amphibia* stand; 9 - willow carrs with *Urtica dioica* in the ground layer; 10 - marshes at seepage waters; transitional zones are depicted by both respective symbols. Regularly cut parts are indicated by the thick line. (b) Dates of the floods: 2-7-1987 (1); 3-1-1987 (2); 5-5-1987 (3); 23-4-1987 (4).

water table in the bore-holes and the discharge are very high in the floodplain segment except the terrace. Distribution of the vegetation units and its relation to the microtopography, derived from the floodwaters pattern, are also demonstrated in Fig. 4. More exact relationships of the vegetation units to the topographic moisture gradient are shown in Table 1.

Results of the direct gradient analysis are given in Fig. 5 where distribution of the most common species along the topographic/moisture gradient is presented. An ecological boundary appears to occur at approximately the middle of the total range of elevation recorded along the transect. In the lower portion of the gradient, aquatic plants and species typical of sedge marshes prevail. Above, species of wet and mesophilous meadows occur under the regular cutting regime, or *Phalaris arundinacea* and *Urtica dioica* expand if the meadows are abandoned. *Phalaris arundinacea* occurs nearly along the whole extent of the elevation gradient.

Changes in species diversity are displayed in Fig. 5 exhibiting an increasing tendency with increasing elevation.

The ordination gave a clear distribution of the vegetation samples (Fig. 6) corresponding well with the results of the direct gradient analysis (Fig. 5). The first axis in the ordination diagram could be clearly interpreted by the topographic/moisture gradient: the correlation coefficient between the elevation and sample score at this ordination axis equals -0.912.

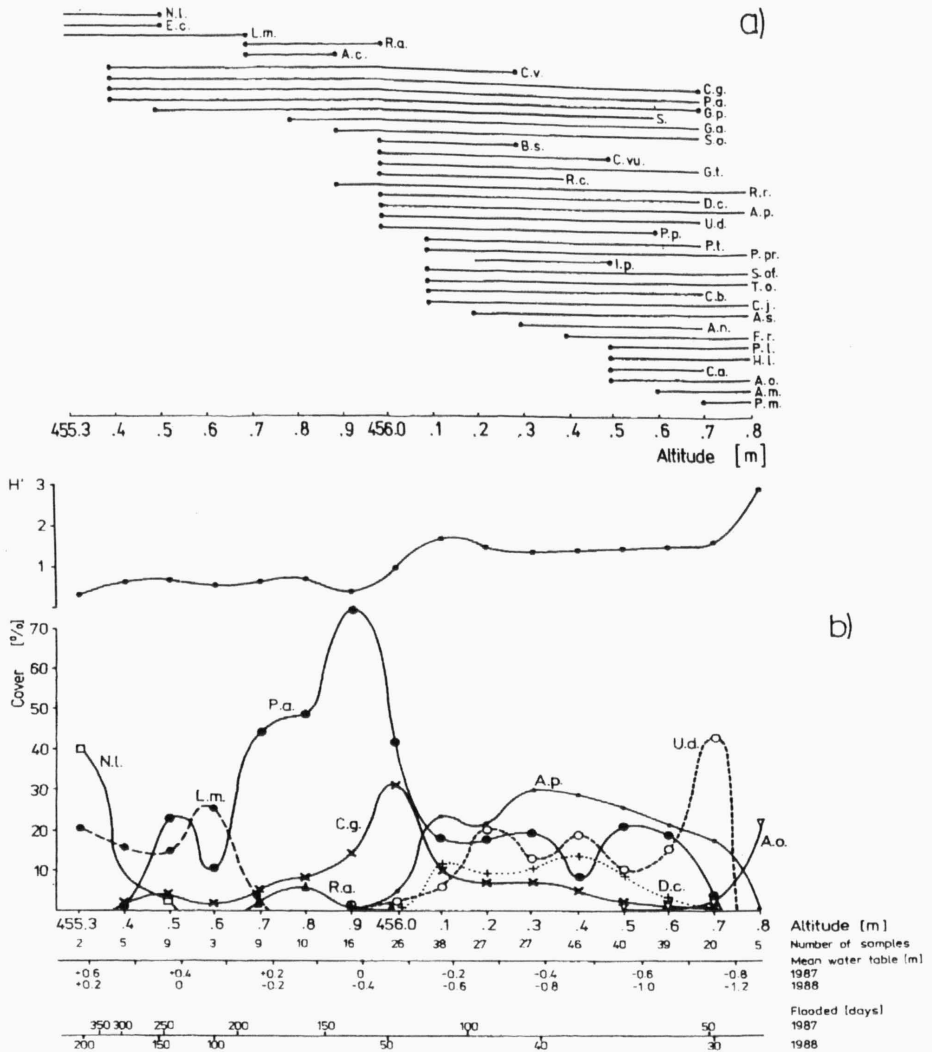


Fig. 5. - Results of the direct gradient analysis: (a) Distribution of principal vascular plant species along the topographic/moisture gradient; expected ecological limits of species distribution are marked by black dots. (b) Changes in cover degrees of dominant species (lines were plotted by eye), and species diversity (Shannon's formula with binary logarithms) along the transect segment. Abbreviations of species names: A.c. - *Acorus calamus*, A.m. - *Achillea millefolium*, A.n. - *Anemone nemorosa*, A.p. - *Alopecurus pratensis*, A.s. - *Angelica sylvestris*, A.o. - *Anthoxanthum odoratum*, B.s. - *Barbarea stricta*, C.a. - *Cirsium arvense*, C.b. - *Carex brizoides*, C.g. - *Carex gracilis*, C.j. - *Centaurea jacea*, C.v. - *Carex vesicaria*, C.vu. - *Carex vulpina*, D.c. - *Deschampsia cespitosa*, E.c. - *Elodea canadensis*, F.r. - *Festuca rubra* agg., G.a. - *Galium aparine*, G.p. - *Galium palustre* s.l., G.t. - *Galeopsis tetrahit*, H.l. - *Holcus lanatus*, I.p. - *Iris pseudacorus*, L.m. - *Lemna minor*, N.l. - *Nuphar lutea*, P.a. - *Phalaris arundinacea*, P.l. - *Plantago lanceolata*, P.m. - *Pimpinella major*, P.p. - *Poa palustris*, P.pr. - *Poa pratensis* agg., Pt. - *Poa trivialis*, R.r. - *Ranunculus repens*, R.a. - *Rorippa amphibia*, R.c. - *Rumex crispus*, S. - *Salix* spec. div. (*S. cinerea*, *S. fragilis*, *S. purpurea*, *S. triandra*, *S. viminalis*), S.of. - *Sanguisorba officinalis*, S.o. - *Symphytum officinale*, T.o. - *Taraxacum officinale* agg., U.d. - *Urtica dioica*.

## Discussion

The altitude of the topographic surface was found being a good measure of the moisture gradient in the narrower floodplain formed by easily drained sediments, excluding the sites influenced by seeping water near the terraces. Plants usually respond to small differences in elevation in floodplains (Menges et Wahler 1983, Metzler et Damman 1985, Shipley et Keddy 1987, etc.), however, direct measurements of water table cannot be avoided in any detailed study on plant distribution and vegetation dynamics in wet meadows and marshes (Grootjans 1985).

The following moisture gradient characteristics are expected to be primarily correlated to the elevation, with the most pronounced effect having on vegetation: (1) frequency and duration of floods, (2) availability of water in dry season, and (3) soil aeration. Two other environmental gradients considered here are also to some extent correlated to the elevation: (4) availability of nutrients, and (5) intensity of disturbances, both natural (e.g., violent stream, ice drift) and artificial (e.g., accessibility for agriculturists enabling grass cutting). For some examples see Robertson et al. 1978, Day et al. 1988.

The correlation coefficient between the sample score on the first DCA-axis and elevation of the topographic surface demonstrates that elevation is responsible for the essence of variability of vegetation in the floodplain (see Jongman et al. 1987).

The coenocline ranging from aquatic plant communities to mesic meadows was evident in the span of only 1.5 m of elevation (see also Rychnovská et al. 1985). The species-rich short-grass meadows were described from the Austrian part of the valley by Balátová et Hübl (1985). Expansions of *Urtica dioica* and *Phalaris arundinacea* were described in details by Šrůtek (1992) and by Klimešová (1992), respectively.

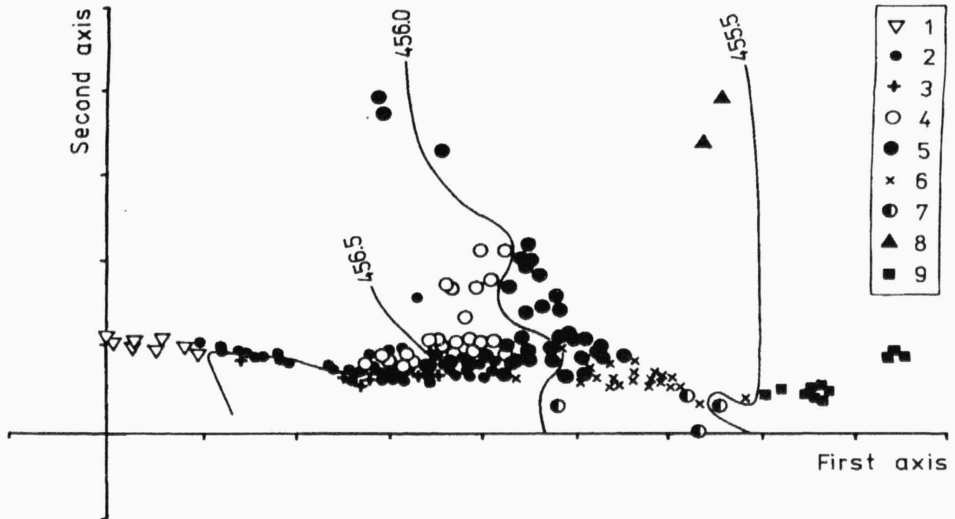


Fig. 6. - Indirect gradient analysis (DCA) of samples related *a priori* to the vegetation units: 1 - short-grass meadows; 2 - *Alopecurus pratensis* meadows; 3 - *Deschampsia cespitosa* meadows; 4 - *Urtica dioica* stands (including willow carrs with *U. dioica*); 5 - *Phalaris arundinacea* stands; 6 - *Carex gracilis* stands; 7 - *Carex vesicaria* stands; 8 - *Rorippa amphibia* stands; 9 - communities of permanent waters. Isolines correspond to the respective altitude.

*Phalaris arundinacea* represents the most common species in the studied part of the floodplain, and it can potentially occupy nearly the whole range of the elevation gradient in the floodplain if left without cutting. In some parts of the Lužnice River floodplain it was observed in meadows abandoned for more than 20 years that *Phalaris arundinacea* overgrew *Alopecurus pratensis*, *Deschampsia cespitosa*, and *Carex gracilis* (Prach et al. 1990). Along the analyzed transect, *Phalaris arundinacea* is partly restricted by grass cutting practised in the higher elevation of the topographic surface (Klimešová 1992).

Riparian *Urtica dioica* communities usually cover the higher surface of natural levees along the river. This is because this species is sensitive to long-lasting floods (Klimešová 1992). The process of ruderalization by *Urtica* and *Phalaris* is generally promoted by increasing anthropogenic eutrophication of the floodplain (see Prach et Rauch 1992).

Table 1. - Occurrence of vegetation units along the topographic/moisture gradient. Percentage of 350 transect plots occupied by the given unit is given in parentheses. Vegetation units are listed according to increasing elevation. Those bore-holes, that best represent the units, are characterized by their elevation and mean position of water table (hydrological year 1986-87); n.a. - not analyzed because of no data available. Correlation coefficients between the water table in bore-holes and water discharge on the day of measurement are given in the last column (data from 20 various days were considered). Differences between mean elevations recorded for two subsequent vegetation units are shown: \* P<0.05, \*\* P<0.01, \*\*\* P<0.001, NS - non-significant.

Vegetation unit and % of plots occupied	Mean elevation (m a.s.l.)	Bore-hole no.	Elevation of bore-hole	Mean position of water table in bore-hole (cm)	Correlation between water table in bore-hole and discharge
<i>Nuphar-Lemna</i> (3.1)	455.49 SD=0.13 *	n.a.			
<i>Rorippa</i> (0.6)	455.85 SD=0.13 NS	3	455.38	+46	0.9578
<i>Carex vesicaria</i> (1.1)	455.94 SD=0.24 **	n.a.			
<i>Carex gracilis</i> (8.6)	456.16 SD=0.31 NS	4	455.74	+8	0.9586
<i>Phalaris</i> (24.9)	456.20 SD=0.29 ***	9	456.00	-7	0.9880
<i>Deschampsia</i> (6.9)	456.37 SD=0.18 NS	6	456.39	-55	0.9814
<i>Alopecurus</i> (29.1)	456.38 SD=0.21 NS	8	456.68	-75	0.9883
<i>Urtica</i> (16.6)	456.40 SD=0.22 ***	2	456.32	-28	0.9840
short-grass meadows (2.9)	456.70 SD=0.12	10	456.83	-68	0.9243
marshes at seepage waters (6.2)	457.33 SD=0.44	12	457.30	-3	0.5628

Correlation between elevation and mean position of water table (1986-87) in 10 bore-holes in the floodplain (excluding those at the terrace):

- 0.9816



The expansion of both above-mentioned species led to the remarkable reduction of species diversity (see also Šrůtek 1992). The short-grass meadows in the driest part of the transect with their highest figure of species diversity can be viewed as a last relic from the period of regular mowing under lower nutrient input (see also Balátová et Hübl 1985).

### Remarks on management

The results presented here enable us to make a few notes on possible management of this particular area. Productive meadows dominated by *Alopecurus pratensis*, being the chief concern of agriculturists, can potentially be re-established within the upper two thirds of the topographic/moisture gradient, i.e. in about two thirds of the floodplain area. Regular cutting is necessary for preservation and restoration of the meadows (experiments are under progress).

In the case of a drastic river canalization and drainage of soil, occasionally proposed by water management experts, the ground water table will drop, and the high-yield meadows will expand to the lower elevation. However, this process would be counterbalanced by the lower productivity and species exchange at the dry end of the coenocline as a consequence of negative drought effects occurring usually in the late summer. As a whole therefore, the expensive canalization of the river would lack positive results for agriculture.

If the floodplain be left without regular management, as occasionally suggested by strict nature conservationists, successional changes would occur due to the absence of grass cutting and high pool of nutrients. Uniform marshes with *Phalaris arundinacea*, in higher elevation accompanied by *Urtica dioica*, would develop over nearly the whole floodplain as can be seen the best at the former "iron curtain" (transect no. 10 in Prach et al. 1990). The marshes will only very slowly be succeeded by willow scrubs because of strong competition under which a successful establishment of shrubs has low chance.

Despite the present degradation of the whole floodplain system (see the lower part of Fig. 2) a possibility still remains to attempt to re-establish more natural meadows and marshes. Regular mowing and, if possible, re-introduction of mowing regime for sites earlier abandoned are the measures necessary for overall revitalization of the floodplain. These measures need to be accompanied only by sporadic and fine-scale drainage schemes. If the measures would be adopted, the arrows in Fig. 2 will slowly turn to the opposite directions than depicted in the figure. Decreasing nutrient input can accelerate the transitions.

### Conclusions

The results presented give answers to the questions addressed in the Introduction:

(1) The moisture gradient was confirmed to be the most responsible for vegetation variability in the floodplain (Fig. 5, Table 1) in combination with the disturbance regime. The disturbance intensity gradient, represented here by cutting for hay, can be simply expressed as binomial variable: cut or uncut sites (Fig. 4). Under present conditions, with the majority of the floodplain being eutrophicated, the importance of the nutrient gradient for vegetation variability seems to be comparably low.

(2) Vegetation response to small differences in the moisture gradient could be shown in that 10 vegetation units were distinguished within only 1.5 m range of elevation. (Figs. 5 and 6, Table 1).

(3) Elevation of the topographic surface can be simply used as a measure of the moisture gradient in the studied floodplain segment except sites near the terrace where the influence of seepage is evident (Fig. 3, Table 1).

The results are in accordance with our empirical knowledge on the relations of vegetation to the main environmental gradient (Fig. 2), being possibly exploited in management practice in the floodplain.

## Acknowledgments

I thank many colleagues for fruitful discussion or comments, especially P. A. Keddy, K. Sýkora, P. Pyšek, M. Rychnovská, E. Balátová, J. Květ, S. Kučera and T. Herben. I am indebted to C. B. Joyce for English revision and to L. Kučerová and O. Černá for technical assistance. The study has been supported by the Czechoslovak Academy of Sciences, grant no. 60520.

## Souhrn

Vztahy mezi vegetací, mikroreléfem a hladinou podzemní vody byly studovány na příčném transektu reprezentativní části nivy Lužnice v CHKO Třeboňsko. Výsledky práce lze shrnout následovně:

(1) Vlhkostní gradient se nejvýznamněji podílí na utváření variability vegetace nivy (obr. 5, tab. 1), v kombinaci s režimem disturbancí. Gradient intenzity disturbancí, jež zde reprezentuje seč, lze vyjádřit jednoduše jako binomickou proměnnou, tj. sečená vs. nesečená místa (obr. 4). V současných podmínkách, kdy je většina nivy eutrofizována, se význam třetího důležitého gradientu - gradientu živin - jeví jako poměrně malý.

(2) Reakci vegetace na malé změny vlhkosti lze demonstrovat na tom, že na pouhém 1,5 m výškového rozdílu bylo rozlišeno 10 vegetačních jednotek.

(3) Vzhledem k snadno propustným sedimentům lze nadmořskou výšku použít jako veličinu charakterizující gradient vlhkosti; výjimku tvoří pouze místa poblíž říční terasy, kde je patrný vliv výstupných vod z terasy (obr. 3, tab. 1).

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Received 9 August 1992  
Accepted 21 September 1992

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Sudhaus W. et Rehfeld K.

### Einführung in die Phylogenetik und Systematik.

Gustav Fischer Verlag, Stuttgart etc., 1992, XI+241 str., 82 obr., 27 tab. [Kniha je v knihovně ČSBS.]

Sudhausova a Rehfeldova kniha je jedním z mála děl, která shrnují moderní teorii systematické biologie v širokém kontextu evoluční biologie. Jde o úvod do fylogenetické systematiky v původním smyslu tohoto termínu; autoři se snaží, i když ne vždy zcela úspěšně a důsledně, vycházet z původních myšlenek Willi Henniga.

Dílo ukazuje sílu a všestrannost přístupů k teorii systematické a evoluční biologie v německé jazykové oblasti a jasně vyvrací mylný dojem, že v pohennigovském období dominuje těmto oborům pouze literatura anglická a americká. Z 296 referencí se 228 týká německy publikovaných prací (včetně překladů z angličtiny). Nutno však přiznat, že řada zásadních anglo-amerických publikací je opomínána.

Prvé dvě kapitoly díla se týkají obecných problémů, specifických přístupů a způsobů uvažování v historické biologii, systematice (ztotožněné s taxonomií) a fylogenetice. Další tři se zabývají jedinci jakožto semaforonty (nosiči znaků), variabilitou populací, jejich organizací do druhů, různými koncepcemi druhu a specií. Následující tři kapitoly diskutují podstatu homologie, význam této koncepce pro rekonstrukci anageneze i kladogeneze, problémy konvergence a negativních znaků, koncepce plesiomorfie a apomorfie a tvorbu kladogramů (chápaných ve smyslu Hennigova *Stammbaumu*). V jedné kapitole se diskutuje vztah kladogramu a hierarchické klasifikace a dvě další se týkají makroevoluce: vztahu mezi ontogenezí a fylogenezí, koncepcí praeadaptace a adaptivních zón a fylogenetických úvah o ekologii a funkci, vycházejících z hypotézy vyjádřené kladogramem. Poslední, teoreticky nejzávažnější kapitola, diskutuje vznik *Bauplánů*, koncepci additivní typogeneze, kmenových a předkovských linií a roli fosilií při rekonstrukci fylogeneze.

Kniha je výborně organizována, přehledně a úměrně členěna, text je odlišným typem písma rozčleněn na hlavní partie, definice a obdobná konstatování, specializované úseky a početné příklady, které navzdory tomu, že oba autoři jsou zoologové, plně respektují i botanické situace. Kniha vznikla z univerzitní přednášky a je zčásti zaměřena na studentskou obec; téměř všechny kapitoly jsou doprovázeny náměty pro praktika, cvičeními a otázkami pro další diskusi a úvahy. Bohužel, někdy pro ně chybí bezpečné teoretické zázemí a třeba i náznak alternativních řešení.

Listoval jsem knihou s entuziasmem a skončil její četbu s velmi smíšenými pocity. Na jedné straně je skutečně systematicky organizována a poskytuje snadný přístup k německy psané a často opomíjené literatuře obecné systematiky i evoluční biologie. Navíc rozvádí a širšímu publiku zpřístupňuje některé termíny a koncepce vytvořené německými biology, týkající se skladby monofyletických taxonů. Tyto termíny a koncepce mají zásadní význam pro dorozumění mezi biology a zejména pro nalezení společné řeči mezi paleontology a neontology. Mám na mysli koncepcce jako je „kmenová linie“ (*Stammlinie* - Ax 1984), „ancestrální linie“ nebo, chceme-li, „linie předků“ (*Ahnenlinie*), „korunová skupina“ (*Kronengruppe* - Jefferies 1980) a „panmonofylum“ (Lauterbach 1989). Už pro toto je třeba knihu číst.

Jakkoli se kniha zdá být dobrým úvodním textem, podíváme-li se na ni pozorněji, zjistíme, že není myšlenkově důsledná. Autoři někdy směšují protichůdné přístupy, někdy nezaujmají pevné stanovisko a vynechávají či nadměrně zjednodušují mnohé důležité oblasti. Jejich údajným cílem je poskytnout modernizovaný přehled fylogenetické systematiky v Hennigově pojetí, t.j. bez přiměsí jiných systematických ideologií a s odmítavým postojem k transformovanému kladismu. To je jistě legitimní přístup. Vezměme však konkrétní příklad. Autoři srovnávají kladistický (hennigovský) přístup ke klasifikaci (pouze monofyla jako jedině ontologicky existující supraspecifické taxony jsou přijatelná) s přístupem evoluční systematiky (mayrovským), v němž nalézají své místo i parafyla, ale omezují se na výčet odlišných přístupů těchto škol a v závěru připouštějí i přijímání parafyl za nepřilíh jasně definovaných okolností. To je jistě zásadní (a vzhledem k proklamovaným cílům jedině negativně hodnotitelný) odklon od cílů klasifikace přesně formulovaných Willi Hennigem a jeho následovníky. Důsledky tohoto nekonzistentního přístupu pro biogeografii (zřídka kdy v knize zmíněnou) a evoluční biologii zůstávají nevysvětleny.

Jindy je však stanovisko autorů překvapivě dogmatické. Axiom, že druh končí svou existenci v čase, jakmile se rozštěpí ve dva, je (v duchu Willmannových úvah) vztažen i na situace, kdy peripatricky odštěpená populace přestála ekologicko-rozmnožovací test parapatrie či sympatrie vzhledem ke zcela nezměněné velké populaci ancestrální, která „končí“ svou druhovou existenci i tehdy, podílí-li se na opětovném vzniku nového druhu hybridizací. Opět jde o zcela legitimní, byť extrémní hodnocení, ale biologicky reálná a mnoha teoretiky systematické i evoluční biologie zastávaná alternativa skutečně pokračující existence předkovského druhu není brána seriózně v úvahu a je pouze oznámkována jako „typologická“. I přehled možných cest sympatrické speciace je příliš zjednodušený a omezený pouze na situace hybridizační a změny způsobů rozmnožování.

Málo místa se dostalo genetickým, ekologickým a etologickým metodám užívaným v biosystematice a minimum prostoru je věnováno molekulárním přístupům k diagnostice, klasifikaci, fylogenetice a srovnání klasického („morfologického“) a molekulárního přístupu. Na str. 136 autoři mylně ujišťují, že všichni evoluční biologové se shodují na tom, že kladogram lze konstruovat pouze dle principů vytčených Willi Hennigem. To prostě není pravda. Nemusíme souhlasit s mnohými metodami numerické fyletiky (kterou nelze směšovat s fenetikou), ale nemůžeme ji ignorovat jako validní přístup k rekonstrukci fylogeneze; v knize se termín numerická fyletika vůbec nevyskytne.

Výklad metody mimoskupinového srovnání za účelem polarizace stavů znaků je nepochybně příliš zjednodušený. V kapitole o ontogenezi a fylogenezi postrádám formálnější přístup, chybí zde obvyklá terminologie pro heterochronické jevy a myslím, že se čtenáři nedostává jasného vodítka, co si s ontogenetickými znaky při interpretaci kladogenese počít. V knize chybějí i některé dnes často užívané kladistické klasifikační konvence - čtenář se např. nesetká ani s termínem plesion.

V obdobném výčtu by bylo snadné pokračovat. Chci však zdůraznit, že navzdory všem nedostatkům jde o publikaci velmi užitečnou, která svým atraktivním podáním tématiky nepochybně získá další zájemce z řad mladé generace o hlubší, teoreticky fundovanější a s evoluční biologii propojené studium systematiky organismů.

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