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The *Molinietum coeruleae* in the Vistula river valley near Kostrze (S. Poland)

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Fourty years ago humid meadows (*Molinietalia*: *Calthion* and *Molinion*) occuppied many hectares of the Vistula valley (ZARZYCKI 1958a,b) (Fig. 1a). As a result of drainage and fertilization, they were transformed into fresh meadows (*Arrhenatheretalia*) and plough land (TUMIDAJOWICZ and ZUBEL 1978) (see Table 1 and Fig. 1b).

The relict of *Molinietum* in Kostrze near Krakow contains many rare and interesting plants (e.g. *Galium boreale, Gentiana pneumonanthe, Gladiolus imbricatus, Iris sibirica, Molinia coerulea, Salix rosmarinifolia, Selinum carvifolia, Serratula tinctoria, Stachys officinalis, Trollius europaeus*).

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Table 1. Constancy of characteristic plant species (Ch.) of humid and fresh meadows in the Vistula valley.
Roman numerals = constancy
I = 1-20, II = 21-40, III = 41-60, IV = 61-80, V = 81-100%
Arabic numerals = cover (Braun-Blanquet scale)
1956 = typical *Molinietum* (ZARZYCKI 1958), 1979 = not precisely the same area (TUMIDAJOWICZ and ZUBEL 1978a), 1988 = fragments of *Molinietalia* only (ZARZYCKI, pers.obs.).

Years	1956	1979	1988
Ch. *Molinietum*			
Gentiana pneumonanthe	V^{+-2}	III^{+}	Fesh meadows and arable land
Molinia coerulea	V$^{2-4}$	III$^{2-4}$	
Silaus flavescens	V^{+-1}	III^{+-2}	
Iris sibirica	IV +-1	II+-1	
Laserpitium prutenicum	III^{+-2}	II^{+-2}	
Gladiolus imbricatus	I^{+-1}	II^{+}	
Ch. *Molinion*			
Galium boreale	V^{+-2}	III$^{1-3}$	
Sanguisorba officinalis	V$^{1-4}$	V^{+-2}	
Selinum carvifolia	V^{+-2}	V^{+-2}	
Serratula tinctoria	V^{+-2}	III^{+-1}	
Succisa pratensis	V^{+-2}	II^{+-1}	
Ch. *Molinietalia*			
Deschampsia caespitosa	V^{+-2}	IV$^{1-4}$	
Lysimachia vulgaris	V^{+-2}	III^{+-2}	
Carex hostiana	IV^{+-3}	I^{2}	
Lychnis flos-cuculi	IV^{+-2}	V^{+-2}	
Lotus uliginosus	II+-1	V^{+-2}	
Lythrum salicaria	I^{+}	II^{+-1}	
Filipendula ulmaria	-	II^{+}	
Angelica silvestris	-	II^{+-1}	
Orchis latifolia	-	II^{+-1}	
Carex panicea	-	II^{+-1}	
Platanthera bifolia	-	II^{+-2}	
Juncus effusus et conglomeratus	-	II^{+-2}	
Ch. *Arrhenatheretum* and *Arrhenatherion*			
Crepis biennis	I^{1}	II^{+-1}	
Daucus carota	I^{+}	-	
Bromus mollis	-	II^{+}	
Trisetum flavescens	-	I^{+}	
Arrhenatherum elatius	-	I^{+}	
Chrysanthemum leucanthemum	V^{+-2}	III^{+}	
Heracleum sphondylium	-	I^{+-1}	
Campanula patula	-	III^{+}	
Knautia arvensis	-	I^{+}	
Ch. *Arrhenatheretalia*			
Achillea millefolium	II^{+}	IV^{+}	
Stellaria graminea	II^{+-1}	III$^{1-2}$	
Dactylis glomerata	-	III$^{1-2}$	
Trifolium repens	III+	II^{+}	
Cynosurus cristatus	V$^{1-2}$	II^{+}	
Alopecurus pratensis	I^{+}	II^{+}	
Trifolium dubium	I^{+}	II^{+}	

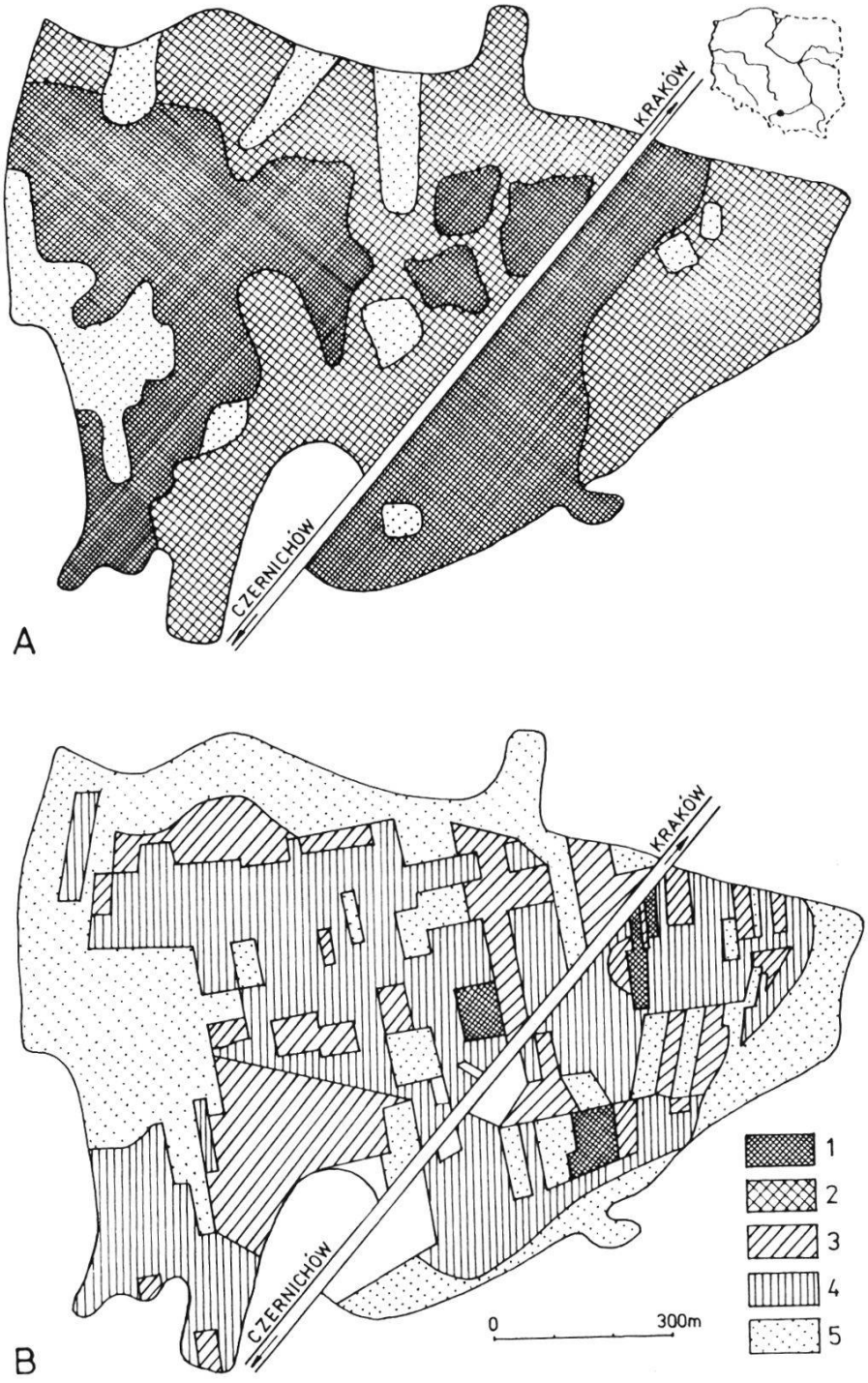

Fig. 1. The phytosociological map of meadow communities in the environs of Czernichow. A - 1947 (PAWLOWSKI et al. 1947), B - 1972 (TUMIDAJOWICZ and ZUBEL 1978).
1 - typical *Molinietum coeruleae*, 2 - poorer *Molinietum coeruleae*, 3 - transitional communities from *Molinietum* to *Arrhenatheretum*, 4 - *Arrhenatheretum elatioris*, 5 - arable lands.