INTERNATIONAL ASSOCIATION FOR DANUBE RESEARCH

OF THE INTERNATIONAL ASSOCIATION FOR THEORETICAL AND APPLIED LIMNOLOGY

LIMNOLOGICAL REPORTS

VOLUME 35

Proceedings

35th IAD Conference, Novi Sad, Serbia and Montenegro, 2004

Editors

Ivana Teodorović Snežana Radulović

Jürg Bloesch

visio mundi academic press

National Committee of IAD Serbia and Montenegro

Internat. Assoc. Danube Res.	35	503–507	Novi Sad, April 2004

Senecio paludosus (*Compositae*) along the Danube River

[1] HODÁLOVÁ, I., [2] GRULICH V., [1,3] MARHOLD K., [1] OT'AHEL'OVÁ, H.

[1] Institute of Botany, Slovak Academy of Sciences, Bratislava, Slovakia
[2] Department of Botany, Masaryk University, Brno, Czech Republic
[3] Department of Botany, Charles University, Praha, Czech Republic

Abstract: The study of *Senecio paludosus* L. in Europe showed that three subspecies can be recognised in this area: *S. paludosus* L. subsp. *paludosus*, *S. paludosus* subsp. *angustifolius* Holub and *S. paludosus* subsp. *lanatus* Holub. Along the Danube River (Germany, Austria, Slovakia, Hungary and Romania) predominantly *S. paludosus* subsp. *angustifolius* occurs. In Slovakia this subspecies was recorded mainly in the communities of the alliances *Phragmition communis* Koch 1926 and *Magnocaricion elatae* Koch 1926. *Senecio paludosus* is a characteristic species of the order *Phragmitetalia* Koch 1926.

Zusammenfassung: Eine Studie von *Senecio paludosus* L. in Europa konnte drei Unterarten in diesem Gebiet unterscheiden: *S. paludosus* L. subsp. *paludosus, S. paludosus* subsp. *angustifolius* Holub and *S. paludosus* subsp. *lanatus* Holub. Entlang der Donau (Deutschland, Österreich, Slovakei, Ungarn und Rumänien) trat vorwiegend *S. paludosus* subsp. *angustifolius* auf. In der Slovakei wurde diese Subspecies vor allem in den Gemeinschaften des Verbandes *Phragmition communis* Koch 1926 and *Magnocaricion elatae* Koch 1926 gefunden. *Senecio paludosus* ist eine Charakterart der Ordnung *Phragmitetalia* Koch 1926.

Key words: *Senecio paludosus, Compositae, Danube River, phytocoenology*

Introduction

As a result of multivariate morphometric study of material from Central and Western Europe (with additional material from Eastern and Northern Europe), three subspecies – *S. paludosus* L. subsp. *paludosus, S. paludosus* subsp. *angustifolius* Holub and *S. paludosus* subsp. *lanatus* Holub – were recognised (HODÁLOVÁ et al. 2002). They occupy their own, although partially overlapping, areas. *Senecio paludosus* subsp. *paludosus* is a more continental taxon was confirmed for Northern, Central and Eastern Europe, subsp. *lanatus* occurs in Central and Eastern Europe, while subsp. *angustifolius*, being more oceanic, occurs in Western and Central parts of Europe. The combination of several correlated characters, including indument of achenes, and indument and shape of leaves (see the identification key, Fig. 1), can be used for distinguishing them. Detailed morphometric analyses confirmed their good morphological separation, and despite intermediate

types between subsp. *angustifolius* and subsp. *paludosus* occur in certain areas, the existence of three morphologically defined groups is beyond any doubts.

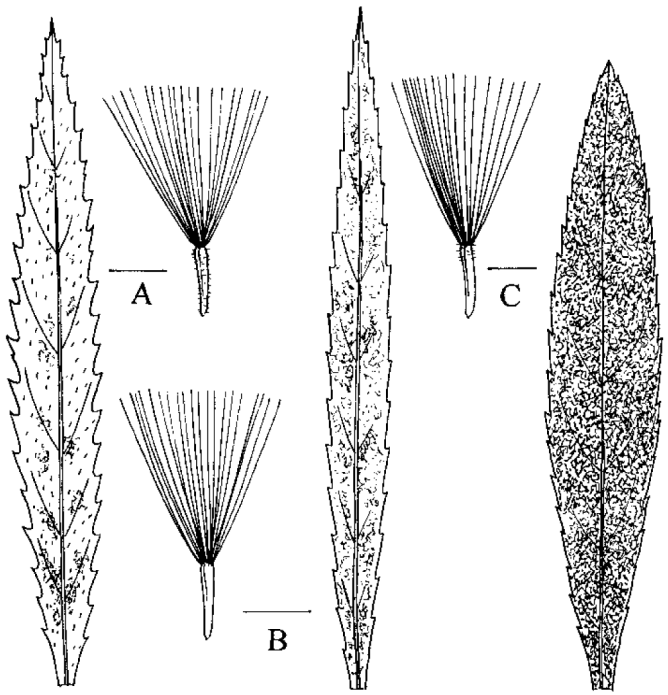

Fig. 1. A. *Senecio paludosus* subsp. *paludosus*. – B. *Senecio paludosus* subsp. *angustifolius*. – C. *Senecio paludosus* subsp. *lanatus*. – indument of lower surface of leaves. – indument of achenes.

KEY TO THE SUBSPECIES OF *SENECIO PALUDOSUS* L. OCCURRING IN EUROPE.

Leaves hairy (mainly with short articulate hairs) or rarely glabrous beneath; achenes hairy on whole surface. – Cauline leaves anguste-ovate, elliptic, 1.2–2.3 (–3.5) cm wide, narrowed or shortly petiolate at the base, glabrous or sparsely arachnoid above .....**subsp. *paludosus***

Leaves arachnoid beneath; achenes glabrous. – Cauline leaves lanceolate, 0.7–1.2 (–2.5) cm wide, semiamplexicaul or narrowed at the base, sparsely arachnoid or glabrous above .....**subsp. *angustifolius***

Plants intermediate between subsp. *paludosus* and subsp. *angustifolius* have leaves beneath with an arachnoid (typical for subsp. *angustifolius*) or mixed (arachnoid with short articulate hairs on the same plants) type of indument, and achenes hairy on whole surface (typical for subsp. *paludosus*).

Leaves lanate beneath; achenes hairy in upper part only. – Cauline leaves anguste-ovate, elliptic, 1.3–2.0 (–3.5) cm wide, narrowed or shortly petiolate at the base, densely or rarely sparsely arachnoid above.....**subsp. *lanatus***

Material and Methods

The study of *S. paludosus* along the Danube River is based on our own collections (deposited in BRNU and SAV), on material from several herbaria (BM, BP, BRA, BRNM, G, LY, M, MMI, PR, PRC, SAV, SLO, TO, TUB, W, WU, Z; abbreviations according to HOLMGREN et al. 1990), and on the study of relevant literature. The nomenclature of plants follows MARHOLD, HINDÁK (1998) and phytosociological units follow MUCINA, MAGLOCKÝ (1985) and OTAHEL'OVÁ et al. (2001).

Results and Discussion

The infraspecific taxa of *S. paludosus* are restricted to wet places with standing or slowly flowing water. Along the Danube River mainly *S. paludosus* subsp. *angustifolius* (Germany, Austria, Slovakia, Hungary, Romania) occur; typical representatives of *S. paludosus* subsp. *paludosus* was recorded only in one locality in Hungary [Mosonszentjános (KÁRPÁTI 1931 BP)]. *S. paludosus* subsp. *lanatus* was not confirmed in the area studied.

In upper reaches of the Danube River (in Germany and Austria) intermediate plants between subsp. *angustifolius* and subsp. *paludosus* were recorded (Fig. 2). However, the „pure" populations of *S. paludosus* subsp. *paludosus* are lacking in German part of the Danube River. Thus, the presence of these intermediates is difficult to explain. One of the likely explanations is that it might result from recent introgression between above mentioned two subspecies as the other parental taxon, subsp. *paludosus* occurs in neighbouring areas.

From lower reaches of the Danube River we did not record *S. paludosus* (Croatia, Serbia and Montenegro, and Bulgaria) due to lack of herbarium materials. However, the occurrence of this species also in this part of the Danube River is very likely and these part of distribution areas of *S. paludosus* requires more detailed study.

The natural habitats of *S. paludosus* are fresh-water wetlands, mainly flooded areas along the lower reaches of rivers. From phytosociological point of view, *S. paludosus* is a characteristic taxon of the order *Phragmitetalia* KOCH 1926 (class *Phragmito-Magnocaricetea* KLIKA in KLIKA et NOVÁK 1941). This order comprises the communities of reeds and tall sedges of the margin of slowly flowing rivers or stagnant water-bodies of fluctuating depth, and sometimes of waterlogged grounds. In Slovakia, *S. paludosus* was found in communities of both alliances: *Phragmition communis* KOCH 1926 (in associations *Phragmitetum vulgaris* SOÓ 1927, *Scirpetum lacustris* CHOUARD 1924, *Glycerietum aquaticae* HUECK 1931) and *Magnocaricion elatae* KOCH 1926 (in associations *Phalaridetum arundi-*

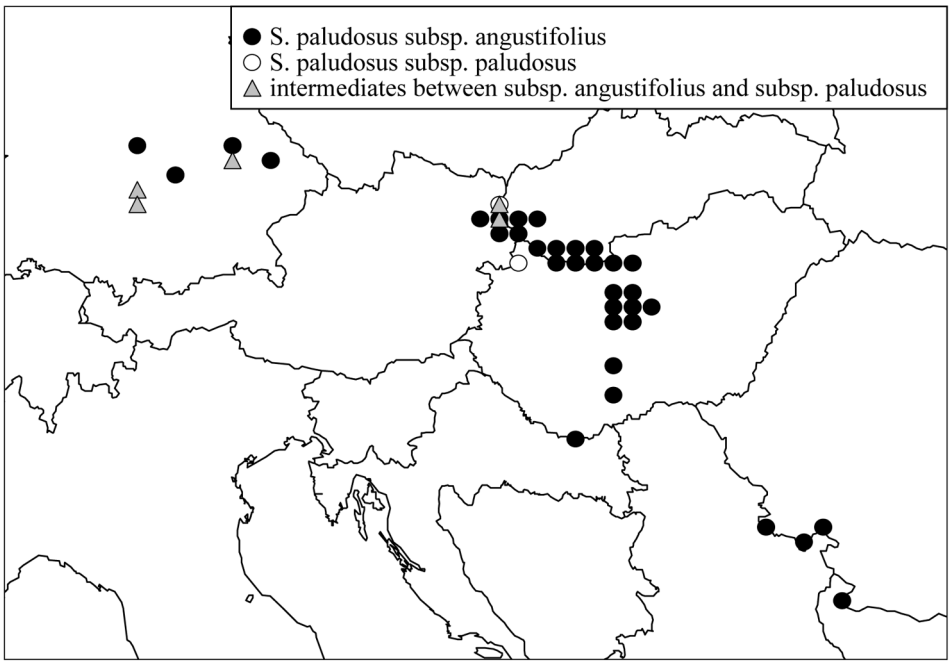

Figure 2. Distribution map of herbarium specimens studied occurring along of the Danube River. *Senecio paludosus* subsp. *paludosus* (○); *S. paludosus* subsp. *angustifolius* (●); intermediates between subsp. *paludosus* and subsp. *angustifolius* (△).

naceae LIBBERT 1931 and *Galio palustris-Caricetum rippariae* BALÁTOVÁ-TULÁČKOVÁ et al. 1993).

Besides the grass-herb fringe communities, *S. paludosus* occurs also in floodplain forests. It is present both in the willow-poplar forests belonging to the alliance *Salicion albae* (OBERD. 1953) Th. MÜLLER et GÖRS 1958 (in association *Salicetum albae-fragilis typicum* JURKO 1958) and in the natural elm-ash floodplain forests belonging to *Ulmenion* OBERD. 1953 in associations *Fraxino pannonicae-Ulmetum* SOÓ 1963 and *Carici (acutiformis-ripariae) – Fraxinetum angustifoliae* JURKO 1958].

Despite its coenotic optimum in above listed communities, the taxon abundance usually reaches here only low values. The cover of *S. paludosus* plants in phytosociological relevés recorded in Slovakia is below or equal to 5%.

Its frequently accompanying plant species are as follows: *Bidens tripartita, Caltha palustris, Calystegia sepium, Carex acuta, C. riparia, Galium palustre, Glyceria maxima, Iris pseudacorus, Lycopus europaeus, Lysimachia nummularia, L. vulgaris, Lythrum salicaria, Mentha aquatica, Phalaris arundinacea, Phellandrium aquaticum, Phragmites australis, Ranunculus lingua, R. repens, Rorippa amphibia, Rumex mari-*

timus, Schoenoplectus lacustris, Sium latifolium, Solanum dulcamara, Stachys palustris, Symphytum officinale.

Generally, *S. paludosus* occurs in above-mentioned ecotone communities, which are commonly invaded by alien species, e.g. *Aster novi-belgii, Impatiens glandulifera, Solidago gigantea*. The evident retreat of *S.paludosus* is partly caused by the alternations in the water regime, due to the streamlining of the banks of watercourses, and due to the drainage of wetlands.

References

HODÁLOVÁ, I., GRULICH, V., MARHOLD K. (2002): A multivariate morphometric study of *Senecio paludosus* (*Compositae*) in Central and Western Europe. – Bot. Helv., 112:137–151.

HOLMGREN, P. K., HOLMGREN, N. H. & BARNETT, L. C. (eds) (1990): Index Herbarium. Part I.: The Herbaria of the world. Ed. 8. – Regnum Veg., 120:1–394.

MARHOLD K., HINDÁK F. (eds) (1998): Zoznam nižších a vyšších rastlín Slovenska – Checklist of non-vascular and vascular plants of Slovakia. Veda, VSAV, Bratislava, 687.

MUCINA, L., MAGLOCKÝ, Š. (eds) (1985): A list of vegetation units of Slovakia. – Docum. Phytosociol., Camerino, N.S., 9:175–220.

OTAHEL'OVÁ, H., HRIVNÁK, R., VALACHOVIČ, M. (2001): *Phragmito-Magnocaricetea*. – In: VALACHOVIČ M. (ed.), Rastlinné spoločenstvá Slovenska. 3. Vegetácia mokradí. Veda, Bratislava, pp. 51–183.

Author' address

Hodálová I., Ot'aheľová, H.
Institute of Botany, Slovak Academy of Sciences,
Dúbravská cesta 14, SK-845 23 Bratislava, Slovakia

Grulich V.,
Department of Botany, Masaryk University,
Kotlárská 2, CZ-611 37 Brno, Czech Republic

Marhold, K.
Department of Botany, Charles University,
Benátská 2, CZ-128 01 Praha 2, Czech Republic