

Festuca trichophylla (Ducros ex Gaudin) K. Richter (Poaceae) in the flora of Croatia

ANTUN ALEGRO*

University of Zagreb, Faculty of Science, Department of Botany, Marulićev trg 20,
10000 Zagreb, Croatia

The occurrence of *Festuca trichophylla* subsp. *trichophylla* in the flora of Croatia is confirmed. In June 1999 a small population was found on the edge of Čepić polje, near the village of Šušnjevića (Istria) growing on a relatively moist calcareous meadow belonging to the order *Scorzoneretalia*. The soil is weakly basiphilous with high amount of CaCO₃. According to the present state of knowledge the species could be treated as critically endangered.

Key words: *Festuca trichophylla*, flora, Istria, Croatia

Introduction

Traditionally, the species *F. trichophylla* (Ducros ex Gaudin) K. Richter (basion.: *Festuca rubra* L. var. *trichophylla* Ducros ex Gaudin) was treated as a member of *F. rubra* agg. In recent publications, however, *F. trichophylla* has been placed in separate *F. trichophylla* agg. which comprises eight species distributed in the Mediterranean region (AL-BERMANI et. al. 1992, FOGGI and ROSSI 1996).

It is a member of the Mediterranean (KIEM 1987), sub-Mediterranean (OBERDORFER 1994) or South European (PIGNATTI 1982) floral element. The species is generally distributed in South Europe and in southern parts of Central Europe: from the Iberian peninsula to Romania (cf. CONERT 1998).

According to MARKGRAF-DANNENBERG (1979) *F. trichophylla* is the only species from *F. rubra* agg. which is not bound to mountain habitats in the Mediterranean part of its area, but inhabits warm, calcareous fen peats. As a species of warm, calcareous fen peats belonging to the classes *Molinietea* and *Schoenetetea* it is also quoted by KIEM (1987). Similarly, CONERT (1998, 2000) quotes alternate dry-moist meadows and calcareous fen peats belonging to the order *Violion* as a habitat of this species, and HAUPELER and MUER (2000) quote calcareous meadows with *Molinia caerulea* (*Molinion caeruleae* p.p.).

The »Index Florae Croatiae« (ILIJANIĆ and TOPIĆ 2000) has not quoted the species *F. trichophylla*. In addition, there are no herbarium specimens of this species deposited in ZA

* Corresponding address: fax.: ++ 385 1 48 95 560, e-mail: antun.alegro@ka.hinet.hr

and ZAHO. But in FREYN (1881: 390), under the name *F. rubra* L., we can read: »Bisher nur auf nassen Stellen des Prato grande bei Pola. Die Pflanze von Pola ist hellgrün, ungemein dünn und zart, mit sehr kurzen Läufern, so dass ich letztere ursprünglich übersah, und diese Form für *F. duriuscula* hielt.« This description of plant and its habitat could be applicable to the species *F. trichophylla*. His specimens were determined by Hackel as *F. rubra* L. subsp. *eu-rubra* var. *trichophylla* Gaud. subvar. *uliginosa* (Schur.) Hackel (cf. HACKEL 1882). Frayn's finding was also quoted by ASCHERSON and GRAEBNER (1898–1902: 500).



Fig.1. *Festuca trichophylla* (Ducros ex Gaud.) K. Richt.

Materials and Methods

The standard keys for determination were used (MARKGRAF-DANNENBERG 1980; CONERT 1998, 2000; PORTAL 1999, JOGAN 1999). The collected specimens were additionally compared with those deposited in the herbarium collection WU. The position of the locality was estimated with a Magellan GPS 3000 XL device. A standard phytocenological relevé, with cover-abundance indices (BRAUN-BLANQUET 1964) in the surrounding vegetation was also made. The system of characteristic species and syntaxonomical categories was taken over from HORVATÍĆ (1975), POLDINI (1989) and KALIGARIĆ (1997). The amount of calcium-carbonate was estimated using Scheibler's device (STEUBING 1963, ŠKORIĆ 1982). The pH value was measured in a water solution and in $0,1 \text{ mol dm}^{-3}$ KCl (STEUBING and FANGMEIER 1992) using an IQ150 pH-meter.

Results and Discussion

Festuca trichophylla subsp. *trichophylla* (fig.1) was found in the June 1999 on the edge of Čepić polje, in the surroundings of the village of Šušnjeвица in the western part of Istria (Fig. 2). Vegetationally this region belongs to the epi-Mediterranean zone with climato-

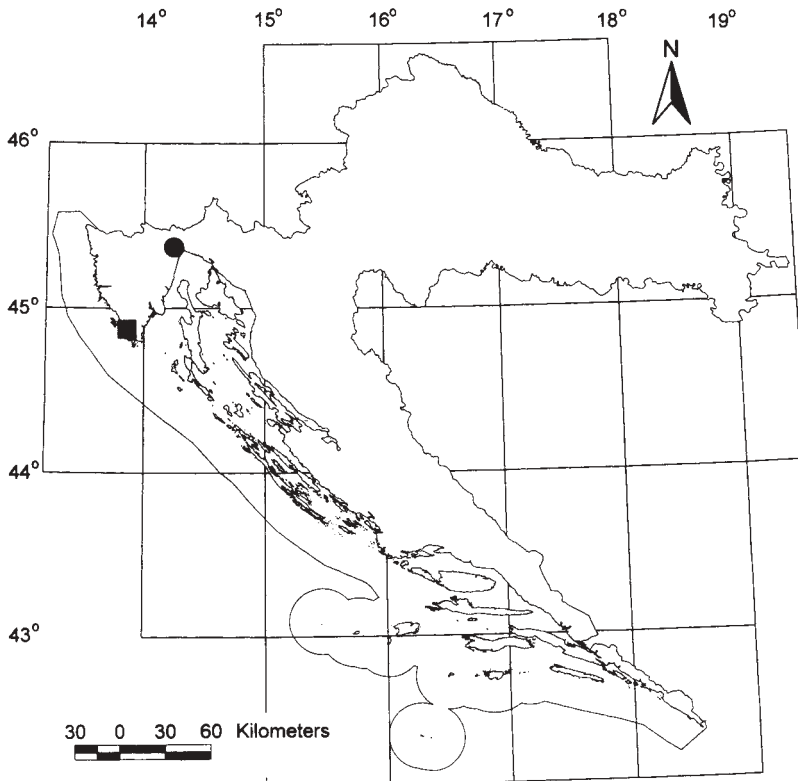


Fig. 2. The locality of *F. trichophylla* in Croatia (●). Possible locality of *F. trichophylla* in 19th century according to FREYN (1881) (■).

Tab. 1. Floristic Composition and phytosociological position of the meadow with *Festuca trichophylla*

<i>Festuca trichophylla</i> (Ducros ex Gaud.) K. Richter	+
Scorzonerion villosae Horvatić 49 incl. introgressive species	
<i>Rhinanthus freynii</i> (A. Kern. ex Sterneck) Fiori	3
<i>Knautia illyrica</i> Beck	1
<i>Carex tomentosa</i> L.	+
<i>Daucus carota</i> L.	+
<i>Ononis spinosa</i> L.	+
<i>Orchis coriophora</i> L. subsp. <i>fragrans</i> (Pollini) Sudre	+
<i>Prunella laciniata</i> (L.) L.	+
Scorzoneretalia villosae Horvatić 75	
<i>Scorzonera villosa</i> Scop.	+
<i>Centaurea pannonica</i> (Heuff.) Simonk.	+
<i>Dorycnium germanicum</i> (Gremli) Rikli	+
<i>Lotus corniculatus</i> L. var. <i>hirsutus</i> Koch	+
<i>Polygala nicaeensis</i> Risso ex Koch	+
<i>Salvia pratensis</i> L.	+
<i>Thymus longicaulis</i> agg.	+
Festuco-Brometea Br.-Bl. et Tx. 43	
<i>Bromus erectus</i> agg.	2
<i>Chrysopogon gryllus</i> (L.) Trin.	2
<i>Brachypodium rupestre</i> (Host) Roem. et Schult.	1
<i>Briza media</i> L.	1
<i>Koeleria pyramidata</i> (Lam.) Beauv.	1
<i>Trifolium montanum</i> L.	1
<i>Carex flacca</i> Schreb.	+
<i>Dactylis glomerata</i> L.	+
<i>Festuca rupicola</i> Heuff.	+
<i>Filipendula vulgaris</i> Moench	+
<i>Galium verum</i> L.	+
<i>Hieracium piloselloides</i> Vill.	+
<i>Hippocrepis comosa</i> L.	+
<i>Plantago media</i> L.	+
Companions	
<i>Equisetum pratense</i> Ehrh.	+
<i>Genista tinctoria</i> L.	+
<i>Leucanthemum praecox</i> (Horvatić) Horvatić	+
<i>Linum catharticum</i> L.	+
<i>Muscari comosum</i> (L.) Mill.	+
<i>Ornithogalum pyramydale</i> L.	+
<i>Orobanche</i> sp.	+
<i>Picris hieracioides</i> L.	+
<i>Plantago lanceolata</i> L.	+
<i>Poa pratensis</i> L.	+
<i>Trifolium campestre</i> Schreber in Sturm	+

genic forests belonging to the association *Ostryo-Quercetum pubescentis* (ŠUGAR 1984). The coordinates of the locality are: 45° 13' 11''N and 14° 10' 22'' E. The species was growing on alternate moist-dry meadow with plant composition shown in table 1.

According to the floristic composition the meadow could be generally treated as a member of the order *Scorzoneretalia villosae* Horvatić 1975 (*Festuco-Brometea* Br.-Bl. et Tx.). The pH value in water solution is 7, 24 and in a solution of potassium-chloride 7, 09. The amount of calcium carbonate is 29 g per 100 g of soil.

According to the literature data, the species *F. trichophylla* is bound to the moist meadows from the alliance *Molinion* and to calcareous fen peats. On the locality described the amounts of water and, especially, those of pH and calcium carbonate are similar to those in the literature, but phytosociologically the situation is much closer to the alliance *Scorzonerion* than to the alliance *Molinion*. This is probably the consequence of a change in vegetation brought about by land reclamation. Čepić polje, originally wetland, was drained between World War I and II. Hence, the sub-Mediterranean species from surrounding higher positioned grasslands were enabled to penetrate the new habitat. Some species from the previous, more mesophyllous types of grasslands survived, among them *F. trichophylla*.

For the flora of Croatia, *F. trichophylla* can be considered a rare and, due to habitat demands, probably critically endangered plant species, so assessment according to the IUCN criteria should be done (ANONYMUS 2002). Because of the geological structure and anthropogenic influence, wet grasslands are a very rare habitat type in the sub-Mediterranean part of Croatia. The only habitat of *F. trichophylla* in Croatia today is no more than a small residue of wet grasslands that were formerly the main vegetation type on Čepić polje.

References

- ANONYMUS, 2001: IUCN Red list, categories and criteria, 3.1. IUCN Species Survival Commission. IUCN, Gland.
- AL-BERMANI, A.-K. K. A., CATALAN, P., STACE, C. A., 1992: A new circumscription of *Festuca trichophylla* (Gaudin) K. Richter (Gramineae). *An. Jard. Bot. Madrid* 50, 209–220.
- ASCHERSON, P., GRAEBNER, P. 1898–1902: *Synopsis der Mitteleuropäischen Flora* 2/1, Verl. von Gebrüder Borntraeger, Leipzig.
- BRAUN-BLANQUET, J., 1964: *Pflanzensoziologie. Grundzüge der Vegetationskunde*. 3. Springer Verl., Wien.
- CONERT, H. J., 1998: Poaceae. In HEGI, G. (ed.) *Illustrierte Flora von Mitteleuropa* 1/3, 3. Parey Buchverlag, Berlin.
- CONERT, H. J., 2000: *Pareys Gräserbush*. Parey Buchverlag, Berlin.
- FOGGI, B., ROSSI, G., 1996: A survey of the genus *Festuca* L. (Poaceae) in Italy. I. The species of the summit flora in the Tuscan-Emilian Apennines and Apuan Alps. *Waldenowia* 26, 183–215.
- FREYN, J., 1881: *Nachträge zur Flora von Süd-Istrien, zugleich Beiträge zur Flora Gesamt-Istriens enthaltend*. *Verh. Zool. Bot. Ges. Wien* 31, 359–392.
- HACKEL, E., 1882: *Monographia Festucarum Europaeorum*. Th. Fischer, Kassel.

- HAEUPLER, H., MUER, T., 2000: Bildatlas der Farn- und Blütenpflanzen Deutschlands. E. Ulmer Verl. Stuttgart.
- HORVATIĆ, S., 1975: Neuer Beitrag zur Kenntnis der Syntaxonomie der Trockenrasen- und Steintriften-Gesellschaften des Ostadriatischen Karstengebietes. *Problems of Balkan Flora and Vegetation*. 300–310.
- ILJANIĆ, LJ., TOPIĆ, J., 2000: Poaceae. In NIKOLIĆ (ed.), *Index Florae Croatiae* 3. Nat. Croat. 9. Suppl. 1, 130–149.
- JOGAN, N., 1999: Poaceae. In MARTINČIČ, A. (ed.), *Mala flora Slovenije-Ključ za določanje praprotnic in semenk*, 711–813. Tehniška založba Slovenije, Ljubljana.
- KALIGARIČ, M., 1997: Rastlinstvo Primorskega krasa in Slovenske Istre-Travniki in Pašniki. *Zgodovinsko društvo za južno Primorsko, Znanstveno raziskovalno središče Republike Slovenije Koper*, Koper.
- KIEM, J., 1987: Die Gattung *Festuca* in Südtirol und in Nachbargebieten. *Bayer. Bot. Ges.* 58, 53–71.
- MARKGRAF-DANENBERG, I, 1981: *Festuca*-Probleme in ökologisch-soziologischen Zusammenhang. Nachheft zum Bericht über die internationale Fachtagung »Bedeutung der Pflanzensoziologie für eine standortgemäße und umweltgerechte Land- und Almwirtschaft« gehalten an der Bundesversuchsanstalt für alpenländische Landwirtschaft Gumpenstein.
- MARKGRAF-DANNENBERG, I, 1980: *Festuca* L. In TUTIN, T. G., HEYWOOD, V. H. BURGESS, N. A. MOORE, D. M. VALENTINE, D. H. WALTERS, S. M. WEBB D. A. (eds), *Flora Europaea* 5. Cambridge University Press, Cambridge.
- OBERDORFER, E., 1994: *Pflanzensoziologische Exkursionsflora*. Ulmer Verl. Stuttgart.
- PIGNATTI, S., 1982: *Flora d'Italia* 3. Edizioni Agricole, Bologna.
- POLDINI, L., 1989: *La vegetazione del carso isontino e triestino*. Lint, Trieste.
- PORTAL, R., 1999: *Festuca* de France. Vals-près-le-Puy, France.
- STEUBING, L., 1963: *Pflanzenökologisches Praktikum*. Ulmer Verlag, Stuttgart.
- STEUBING, L., FANGMEIER, A., 1992: *Pflanzenökologisches Praktikum*. E. Ulmer Verl., Stuttgart.
- ŠKORIĆ, A., 1982: Priručnik za pedološka istraživanja. Sveučilište u Zagrebu, Fakultet poljoprivrednih znanosti, Zagreb.
- ŠUGAR, I., 1984: Novi pogledi na biljni pokrov i biljnogeografsku raščlanjenost Istre. *Acta Bot. Croat.* 43, 225–234.