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Distribution, ecological and phytosociological characteristics of *Glycyrrhiza glabra* L. in Bulgaria

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Abstract:

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The ecological and phytosociological characteristics of the Common Liquorice (*Glycyrrhiza glabra* L. var. *glandulifera* (Wadst et Kit) Stoj. et Stef.) in Bulgaria have been studied. The plant communities of this taxon have a limited distibution in the floral region - Danube plain. 63 high plants take part in the floral structure of the Common Liquorice. The presence of the anthropophytes (10-12%) is a good confirmation of the hypothesis about the adventive nature of this plant in the bulgarian flora.

Key words: *Glycyrrhiza glabra* L. var. *glandulifera* , ecological, phytosociogical charactheristics

Introduction

Glycyrrhiza glabra L. (Common Liquorice) is a perennial plant from Fabaceae family. It is distributed in South Europe, Asia minor, Persia. This plant is a native species of Mediterranean region but it is cultivated in India, China, Italy, France, Russia, Germany, Spain (Ball, 1968).

The main component of the liquorice's roots is a saponin glycyrrhizin, whose content varies from 7 to12 % (Duke, 1986)

Liquorice is a valuable medicinal plant from ancient times and it is called "drug of first class". This plant is useful as anti-piretic, anti-astmatic, anti-allergic, anti-ulcer, spasmolitic etc. (Modern phytotherapy, 1982, Duke, 1986).

Glycyrrhiza glabra is distributed in Bulgaria only in one floral region (Kozhuharov, 1986). It is included in the Red Data Book of Bulgaria (1984) as a " rare species". According to the Biodiversity Draft Law (2002) this plant is a "protected species". The plant communities of liquorice have been determined as "endangered plant communities" (Velcev, Bondev, 1984).

There is a scanty information about the chorology, ecological and phytosociological characteristics of *Glycyrrhiza glabra* (Stojanov, Avramova, 1957; Todorov, 1979). Genova et al. (1998) have studied the active components of liquorice from different localities and have selected a perspective form with 9.50 % glycyrrhizin in the roots.

Material and methods

Five localities of *Glycyrrhiza glabra*. var. *glandulifera* (Wadst et Kit) Stoj. et Stef. from Danube plain were studied during 1996-2000. These localities have concern to the temperature climatic zone (Velev, 1997).

The tracking method have been used. The plant communities were classified according to the dominant approach.

Results and discussion

Glycyrrhiza glabra L. var. *glandulifera* (Wadst et Kit) Stoj. et Stef. occurs on the dry, sunny habitats. The localities are on the slight slopes or on the hollow areas. The soil is sandy, alluvial with high underground waters.

The liquorice individuals from protected areas (v.Koilovtsi, v. Baical, v. Beltsov, town of Nikopol) are vital, 50-70 cm high. The plants from v. Dolni Vit were strongly depressed from an anthropogenic pressure.The Ministry of Environment and Waters (MEW) have announced this locality also as a protected area at the last years.

The plant communites of liquorice occupy small areas-0,5-3 dka. On the Table 1 are presented comparative data about the areas of five localities for 40 years period (1957-1996).

Table 1. Areas of *Glycyrrhiza glabra* L. (dka) for the period 1957-1996. (**S** – Stojanov, Avramova, 1957; **T** – Todorov, 1979, **OD** – our data, 1996)

Locality	**S**	**T**	**OD**
1.Town of Nikopol	26,00	3,70	3,00
2.v. Dolni Vit	14,00	2,00	0,05
3.v. Koilovtsi	14,00	5,00	2,00
4.v. Baikal	-	2,00	2,00
5.v. Beltsov	12,00	4,00	2,00

There was established that the reduction of liquorice areas was significant for this long period.. This fact can be explained by the unrational gathering of roots for medicinal use. In the last years the regional inspection of MEW has drilled a strict control of these areas.

The liquorice communities are strongly distinguished from the other plant communities. The vertical structure is very clear and the liquorice indivuals distinguished very well on the background of the other plant species in the plant communities. It can be mark small groups of *Glycyrrhiza glabra* as a result of the vegetative propagation. The common plant project cover is very high - 70-100 %. It is interesting to be noticed the increased participation of anthropophytes - 10-12% (*Amaranthus retroflexus, Urtica dioica, Balota nigra* (**Table 2**).

This fact can be explained with the formation of the liquorice communities near to the ancient villages, bridges across the rivers, towns, etc.

The investigated communities of *Glycyrrhiza glabra* belong to three associations:.

I- *Glycyrrhiza glabra* - *Agropyrum intermedium*-locality of town Nikopol.

The common plant project cover is 70%. The floristic composition of this association includes 20 plant species - 3 - *Poaceae*, 2 - *Fabaceae* and 15 - *Mixtoherbosa.*

II- *Glycyrrhiza glabra* - *Mixtoherbosa* - two localities- villages Koilovtsi and Dolni Vit. The common plant project cover in the first locality is 80 %. In this association there were identified 48 plant species. The community in village Dolni Vit is characterized with scanty composition only 12 species because of the neighbouring of the village.

III- *Glycyrrhiza glabra* - *Festuca gigantea* - locality of village Baical. The common plant project cover is 100%. The liquorice individuals are very vital with high 100-150 cm. because of high air and soil humidity. The floristic composition of the plant community includes 25 plant species and 20 species from them are *Mixtoherbosa.*

Conclusion

The plant communities of *Glycyrrhiza glabra* have limited distribution only in a small region of the Danube plain.These communities are well differentiated from the other vegetation because of the clear habit of *Glycyrrhiza glabra* individuals. The floristic composition of these communities includes 63 plant species - many of them are anthropophytes. This fact is a good confirmation of the hypothesis about the adventive nature of this plant in Bulgarian flora.

There is recommended to the regional inspection of MEW to exercise strong control over the localities of *Glycyrrhiza glabra* and to create plantations in suitable ecological regions free of air polution and human impact.

References

Ball, P. 1968. Genus *Glycyrrhiza* L. In: Tutin et al.(eds.) Flora Europea, II, 127.

Duke, J. A. 1986. Handbook of Medicinal Herbs. Press, Inc., Boca Raton, Florida, 215-216.

Genova, E., J. Christova, J. Beeva. 1998. Study on the content of some biologically active compounds in liqourice (*Glycyrrhiza glabra* L.)- Farmazia, XLV, 3-4, 10-13.

Modern phytoterapy.1982. V. Petkov (ed.) Med. i fisk., Sofia, 517.

Kozhuharov, St. 1976. Genus *Glycyrrhiza* L. In: D. Jordanov (ed.) Flora Reip. Popul. Bulg., VI, 185-186.

Kozhuharov, St. 1984. *Glycyrrhiza glabra* L. In: V. Velchev (ed.) Red Data Book of Bulgaria, vol.1. Plants, Sofia, BAS. 193.

Table 2. Phytosociological characteristics of the communities of *Glycyrrhiza glabra* L.

Localities Plant composition	**Town of Nikopol**	**v. Dolni Vit**	**v. Koilovtsi**	**v. Baikal**
Glycyrrhiza glabra L.	3-4 III	2-3 III	3-4 III	4 V
POACEAE				
Agropyrum intermedium (Host.)P.B.	3 III	-	1 II	-
Bromus arvensis L.	-	-	1 II	-
Dactylis glomerata L.	1 II	-	-	-
Dichantium ischaemum (L.) Roberty.	-	-	-	-
Festuca gigantea Vill.	-	-	-	3 IV
Hordeum murinum L.	2 II	-	-	-
Poa pratensis L.	-	-	1 II	-
FABACEAE				
Astragalus onobrychis L.	-	-	1 II	-
Lotus corniculatus L.	-	-	1 II	1 II
Trifolium repens L.	1 II	-	-	-
MIXTOHERBOSA				
Achillea millefolium L.	1 II	-	1 II	1 II
Agrimonia eupatoria L.	1 II	-	1 II	-
Amaranthus retroflexus L.	-	1 II	-	-
Anchusa officinalis L.	-	-	1 II	-
Arctium lappa L.	-	1-2 II	-	-
Artemisia vulgaris L.	-	1 II	-	2 II
Atriplex hortense L.	-	1 II	-	-
Ballota nigra L.	1 II	1 II	1 II	1 II
Berteroa incana (L.) DC.	-	1 II	1 II	-
Calamintha sylvatica L.	-	-	-	1 II
Calendula officinalis L.	-	1 II	-	-
Calystegia sepium (L.) R. Br.	-	-	-	1 II
Carduus hamulosus Ehrh.	1-2 II	-	1 II	-
Centaurea solstitialis L.	-	-	1 II	-
Cephalaria transsylvanica Schrad.	-	-	1 II	-
Chenopodium album L.	-	-	1 II	1 II
Clematis integrifolia L.	-	-	+	-
Convolvulus arvensis L.	1 II	-	1 II	1 II
Cichorium intybus L.	1 II	-	1 II	1 II
Daucus carota L.	-	-	1 II	-
Descurainia sofia (L.)Webb.et Berth.	1 II	1 II	-	-
Dipsacus laciniatus L.	-	-	1 II	-
Echium vulgare L.	-	-	+	-
Erigeron canadensis L.	-	-	-	1 II
Eryngium campestre L.	1 II	-	1 II	-
Euphorbia cyparissias L.	-	-	-	1 II
Fragaria vesca L.	-	-	1 II	-
Galium album L.	-	-	1 II	-
Galium aparine L.	-	-	2 II	-
Galium mollugo L.	1-2 II	-	-	-
Hypericum perforatum L.	-	-	1 II	-
Lactuca serriola L.	1 II	-	1 II	-
Lavatera thuringiaca L.	-	+	-	-
Malva sylvestris L.	-	1 II	-	-
Mentha spicata Huds.	-	-	1 II	1 II
Nigella arvensis L.	-	-	1 II	-

Parietaria erecta W. K.	1-2 II	-	-	-
Plantago major L.	-	-	-	1 II
Polygonum aviculare L.	2 III	-	-	1 II
Potentilla argentea L.	-	-	-	1 II
Potentilla sulphurea Lam.	-	-	1 II	-
Prunella laciniata L.	-	-	-	1 II
Ranunculus sp.	-	-	+	-
Sambucus ebulus L.	+	-	+	+
Solanum nigrum L.	-	1 II	+	-
Stachys germanica L.	-	-	1 II	1 II
Thalictrum minus L.	-	-	1 II	-
Tragopogon pratense L.	-	-	1 II	-
Urtica dioica L.	1-2 II	-	-	1 II
Verbascum sp.	-	-	+	1 II
Verbena officinalis L.	1 II	-	1 II	1 II
Xeranthemum annum L.	-	-	1 II	-

Stojanov, N., B. Avramova. 1957. Investigations on the natural habitats and farmacognostic study on the wild growing *Glycyrrhiza glabra* L. Farmazia, VII, 4, 17-22.

Todorov, T. 1979. About the distribution of Spanish Licorice (*Glycyrrhiza glabra* L.) in Bulgaria. Fitologia, 11, 68-71.

Velev, S. 1997. Climatic regions. In: Geography of Bulgaria, BAS, Sofia, 127-130.

Velchev, V., J. Bondev. 1984. Treatened and rare plant communities in Bulgaria. In: V. Velchev (ed.) Modern theoritical and applied aspects of the plant ecology, Sofia, 1, 94-105.

Rezime

Rasprostranjenje, ekološke i fitocenološke karakteristike vrste *Glycyrrhiza glabra* L. u Bugarskoj

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U periodu od 1996-2000. godine istraživana su 5 lokaliteta vrste *Glycyrrhiza glabra* L. var. *glanulifera* u Bugarskoj. Ustanovljeno je da su u toku 40 godina površine pod ovom vrstom značajno smanjene. Svi istraživani lokaliteti su proglašeni zaštićenim objektima prirode, a vrsta je uključena u Prilog 3 Zakona o biološkoj raznovrsnosti (2002) u kategoriji "zaštićena".

Floristički sastav zajednice u kojoj se javlja ova vrsta je relativno bogat i obuhvata 63 vrste viših biljaka. Zbog blizine lokaliteta naseljenim mestima, veliki deo od tih vrsta su antropofite. Ta činjenica je potvrda hipotezi da je *Glycyrrhiza glabra* L. adventivne prirode.

Neophodno je da se primenjuju strožije mere kontrole stanja lokaliteta, kao i da se