CHARACTERIZATION OF TWO NEW HABITATS FROM THE DOBROGEA PLATEAU–ROMANIA

MIHAI PETRESCU

For the first time two new habitats from the Dobrogea Plateau – Romania, that can be considered endemic for this region and very rare in Europe, are described in this paper and they are represented by *Celtis glabrata* woods and Dobrogean wooded steppe. These habitats are also characterized by the occurrence of numerous nationally and/or globally threatened species and plant communities. Thus, we consider that these two habitats should be legally protected as prioritary ones at the national and global levels.

Key words: Celtis glabrata woods, Dobrogean wooded steppe, Dobrogea Plateau, habitats.

INTRODUCTION

Dobrogea Plateau, situated in south-east Romania, despite its remarkable plant and habitat diversities, being comparable from this point of view with the Danube Delta, is less known and protected. The geographical position at a crossroad of the biogeographical ranges limits of many Central-European, Balkan, sub-Mediterranean and Caucasian species, its character of refuge during the glaciations for numerous ligneous species (Paşcovschi, 1967), the high biotopes variety, the existence here of one of the driest climates in the South-East Europe, are the main factors that explain the occurrence of endemic associations and habitats.

For the first time, in this paper there will be described two habitats that can be considered endemic for Dobrogea so far.

MATERIAL AND METHODS

The two habitats were identified by the study on itinerary method. Thus, most of the natural areas of the Dobrogea Plateau, situated in south-east Romania, were investigated, making possible the identification of the locations and the observations upon the variability of these two habitats, in order to allow their description as new types. The habitat types characterization and denomination were made according to the methodology used in the publication *A classification of Palearctic habitats* (Devilliers, Devilliers, 1996), in the PHYSIS database (Institut Royal des Sciences Naturelles de Belgique) and within the cards used for the proposals of new habitats within the Habitats Directive.

The *Celtis glabrata* woods habitat, that corresponds to only one plant community, respectively *Gymnospermio altaicae-Celtetum glabratae*, was characterized on the basis of the phytocoenological description (Braun-Blanquet method) of this plant community, that was identified and described for the first time within our field investigations (Petrescu, 2000–2001).

The Dobrogean wooded steppe habitat description was considered necessary as this habitat has an endemic character, due to the high specificity for the Dobrogea Plateau of many of the habitat sub-types and /or plant communities that form this phytocoenological complex. Theses features create major differences between this type and the others included in the upper habitat category of the 93 Wooded steppe, protected by the Resolution 4/ 1996 – Convention on the Conservation of European Wildlife and Natural Habitats.

Besides the study on itinerary method, the description of this habitat type was made both by using our phytocoenological descriptions (Petrescu, 2000, Petrescu, mss.), the ones mentioned in the PHYSIS database, as well as in the literature concerning the different plant communities included in this habitat (Dihoru, Doniță, 1970; Horeanu, 1976; Sanda, Arcuş, 1999; Sanda, Popescu, Stanciu 2001, Sanda, 2002). The plant communities denominations correspond to the previously mentioned papers.

The habitat denominations, with the exception of the two ones described in the present paper, correspond to the publication *A classification of Palearctic habitats* (Devilliers, Devilliers, 1996), to the PHYSIS database (Institut Royal des Sciences Naturelles de Belgique) and to the Resolution 4/1996 – Convention on the Conservation of European Wildlife and Natural Habitats. The correspondence between the synonymous plant communities was made according to the publication *Vademecum ceno-structural privind covorul vegetal din România* (Sanda, 2002).

The plant species denominations are mentioned according to the last 5 papers, with the exception of the threatened species that correspond to the following publications: *Lista roşie a plantelor superioare din România* (Oltean *et al.*, 1994); *European Red List of Globally Threatened Animals and Plants* (D46), 1991; *Resolution 6/ 1996* – Convention on the Conservation of European Wildlife and Natural Habitats.

Each of the two habitats described here is characterized by numerous globally threatened animal species, which increase their conservation value. Still, as the topic of this paper consists in the flora and vegetation aspects of the habitats, we will only mention this fauna species number, without their denomination.

RESULTS AND DISCUSSION

I. Dobrogean *Celtis glabrata* woods habitat

The plant community *Gymnospermio altaicae-Celtetum glabratae* was recently described, from the phytosociological point of view, in the Romanian literature (Petrescu, 2000–2001). This extremely rare endemic habitat is described

here for the first time and so it is not yet framed in the Palaearctic Habitats or CORINE classifications. Nevertheless, it can be at least framed into the Palaearctic Habitats classification, in the habitat category 4 Forests, the sub-category 41 Broad-leaved deciduous forests.

Definition and characteristics

Xeromesophyllous, low acidophyllous-neutrophyllous *Celtis glabrata* woods on granite and Palaeozoic schists of the Romanian Dobrogea Plateau, with *Carpinus orientalis*, *Fraxinus ornus*, *Tilia tomentosa, Cerasus mahaleb*, *Quercus pubescens*, *Acer tataricum*, with *Crataegus monogyna* and *Cornus mas* in the shrub layer and *Gymnospermium altaicum*, *Anthriscus cerefolium*, *Corydalis solida*, *Stellaria media*, *Paeonia peregrina*, *Erysimum cuspidatum*, *Melica ciliata*, *Campanula romanica*, *Moehringia grisebachii*, *Dianthus nardiformis* in the herb layer.

Threatened species

Among the characteristic plant species listed in the definition, the following are included on the national red list: *Celtis glabrata, Gymnospermium altaicum, Erysimum cuspidatum, Paeonia peregrina, Moehringia grisebachii, Dianthus nardiformis, Campanula romanica.* The last three species are also mentioned as vulnerable in the European Red List. The endemic species *Campanula romanica* is also included in the Resolution 6/1996 of the Berne Convention.

So far there have been identified about 11 characteristic globally threatened animal species that occur in this habitat.

Phytocoenological characteristics

Being recently described as a plant community, we give below its position in the phytocoenological classification:

Class **QUERCETEA PUBESCENTI-PETRAEAE** (Oberd.1948) Jacuks 1960

Order ORNO-COTINETALIA Jacuks 1960

Alliance **Syringo-Carpinion orientalis** Horv.54

Association *Gymnospermio altaicae-Celtetum glabratae* Petrescu 2000–2001

Within this plant community there was also described the subassociation *tilietosum*, dominated by *Tilia tomentosa*, where *Celtis glabrata* is codominant.

Similarities with other habitats

Even though it is a very distinctive habitat, being dominated by the threatened species *Celtis glabrata* and having numerous species typical for the rocky biotopes where it occurs, so far it can be considered the closest, from the species inventory point of view, to the *Paeonio peregrinae-Carpinetum orientalis* plant community, that corresponds to the habitat 41.73723 Moesian *Paeonia peregrina* – white oak woods.

Geographical distribution

Worldwide this habitat was so far identified only in the Dobrogea Plateau-Romania. In this region it was identified mainly in the Măcin Mountains, where

from it was described in its typical form. Recently it was also observed on a very restricted area, in the Niculițel Plateau (Sarica Hill), also on siliceous substrates. On calcareous substrates, having a shrub layer of *Paliurus spina-christi,* it was identified in Central Dobrogea, southwards of Hârşova town and as association fragments in the Babadag Plateau, between Enisala and Sălcioara localities. As association fragments, without *Paliurus spina-christi*, it was also identified between the Cheia and Târguşor localities (Constanța County), near the right riverbank of the Casimcea River, and in the Tulcea County, southwards of Lăstuni village as well as between Cataloi and Agighiol localities.

Associated habitats

This habitat is usually associated with 41.73723 Moesian *Paeonia peregrina*-white oak woods, 41.73724 Moesian Galium *dasypodium*-white oak woods, 34.92 Ponto-Sarmatic steppes or 41.7683 Dobrogean oriental hornbeam-lime-oak forests.

Threats

The habitat is usually situated on hardly accessible locations and on extreme conditions which protect it naturally against human intervention and/or natural successions, up to a certain degree. Still, we can consider as a potential threat for this habitat the species succession, especially in the less extreme biotopes that could allow other species to become dominant. Other threats could be accidental fires, tree cutting, grazing, rare plant gathering, trampling.

Protection proposals

This habitat has a small natural range by reason of its intrinsically restricted area. It is extremely rare in Romania and subsequently in Europe, so far being only found in Dobrogea region, on a several hectares area. Also it is important to mention that this is one of the richest in threatened species habitats of the Dobrogea Plateau. Thus, even if now most of it is conserved in the Măcin Mountains National Park, there are still some areas of this habitat that have no legal protection.

Thus we consider that this habitat should be mentioned as a priority subtype within the national and European habitat protection laws or conventions, being necessary to protect it throughout its restricted natural range, mainly within the protected areas network.

II. Dobrogean wooded steppe habitat

This habitat subtype is described here for the first time, so it has no code yet according to the Palaearctic Classification. It is framed in the habitat category 9 Wooded grasslands and scrubs, in the sub-category 93 Wooded steppe.

Definition and characteristics

Mosaic vegetation that occurs in the Romanian Dobrogea Plateau, composed of steppe grasslands, shrubs, scattered or grouped trees and small patches of forest. The key species for this complex habitat are tree species like *Quercus pubescens*, *Quercus pedunculiflora*, *Carpinus orientalis*, *Fraxinus ornus*, shrub species, such as *Prunus spinosa*, *Crataegus monogyna*, *Cornus mas*, *Cotinus coggygria*, *Paliurus spina-christi*, *Jasminium fruticans*, *Prunus tenella* and the following herb

species: *Stipa capillata, Stipa ucrainica, Stipa lessingiana, Festuca valesiaca, Dichantium ischaemum, Thymus zygioides, Koeleria lobata, Pimpinella lithophila, Ornithogalum amphibolum, Campanula romanica, Moehringia grisebachii, Moehringia jankae, Dianthus nardiformis, Ornithogalum fimbriatum, Asphodeline lutea, Paeonia peregrina, Myrrhoides nodosa, Buglossoides purpurocaerulea, Asparagus verticillatus, Galium dasypodum, Mercurialis ovata, Carex michelii, Zerna inermis, Kochia prostrata, Medicago minima, Fragaria viridis.* In particular cases, mainly due to the human intervention, other key species may occur, such as *Quercus petraea, Quercus dalechampii, Quercus polycarpa, Quercus frainetto, Tilia tomentosa, Carpinus betulus, Fraxinus excelsior.*

The specificity of this habitat is mainly given by several plant communities that are endemic for Dobrogea, such as the ones from the *Pimpinello-Thymion zygioidi* alliance and the associations *Paliuretum spinae-christi, Rhamno catharticae-Jasminietum fruticantis, Galio dasypodi-Quercetum pubescentis.* To this there can be added regional associations specific for this province that belong to the alliances *Stipion lessingianae, Festucion valesiacae* and to the plant community *Prunetum moldavicae.*

In order to facilitate mapping and to avoid confusions between this complex habitat and the steppe, respectively the forest habitats, we consider that the Dobrogean wooded steppe habitat should have a coverage of the tree species between 10 and 50% of the habitat area, as according to its denomination the steppe should have a higher occurrence, or at least equal, to the arborescent vegetation. Thus, under 10% coverage of the tree species, their influence on the habitat can be negligible. In this case the habitat could be framed into the 34.92 Ponto-Sarmatic steppe habitat. With a higher coverage than 50 %, as the arborescent vegetation becomes dominant, the habitat could be considered a sparse forest from the 41.7 Thermophilous and supra-Mediterranean oak woods and/or 41.2 Oak-hornbeam forests habitats. These two include all the forest habitat subtypes mentioned below.

Still, according to the definition, the Dobrogean wooded steppe habitat can also include patches of compact forest (coverage over 50 %) but it is recommended that their area should be conventionally less than 1 ha, otherwise being necessary to separate them as forest habitats.

Phytocoenological characteristics

In its typical natural form this habitat is situated in the wooded steppe layer or in the xerotherm sub-Mediterranean forest layer and even, exceptionally, in the mesophyllous Balkan forest layer, especially in the driest areas, that allow the natural development of steppe grasslands in a mosaic with the forest ecosystems. As this habitat is in fact a phytocoenological complex, it should compulsorily include, in its typical form, steppe grasslands, represented by associations from the alliances *Stipion lessingianae* Soó 1947, *Festucion valesiacae* Klika 1931 or *Pimpinello-Thymion zygioidi* Dihoru 1969, 1970, and forest communities or

scaterred trees from the wooded steppe and sub-Mediterranean forests layers, such as *Paeonio peregrinae-Carpinetum orientalis* Doniță 1970, *Fragario viridis-Polyquercetum* Doniță 1970, *Galio dasypodi-Quercetum pubescentis* Doniță 1970, *Quercetum pedunculiflorae* Borza 1937 (syn. *Violo suavis-Quercetum pedunculiflorae* Doniță 1970, *Centaureo stenolepi-Quercetum pedunculiflorae* Doniță 1970). In special conditions, in the mesophyllous forest layer, on very dry biotopes, situated usually on the rocky summits of the hills there were also identified wooded steppes where the arborescent communities are framed in the association *Fraxino orni-Quercetum dalechampii* Doniță 1970. All these types of wooded steppe have usually a natural origin, but they can also be semi-natural, as a result of human intervention through tree cutting and grazing.

Within these grassland and forest phytocoenocomplex usually occur also shrub plant communities, such as *Paliuretum spinae-christi* (Borza 1931 n.n.) Dihoru (1969)1970, *Rhamno catharticae-Jasminietum fruticantis* (Mihai *et al.* 1964) Mititelu *et al.* 1993, *Prunetum tenellae* Soó 1946 or *Prunetum moldavicae* (syn. *Pruno spinosae-Crataegetum* Soó 1927.

Within the field investigations there were also identified other wooded steppes that are usually the result of human intervention, as they occur in the mesophyllous forest layer, on more humid conditions than the previously mentioned forest associations. In this layer the steppe grasslands do not usually occur naturally, being less competitive for this habitat in comparison with the forests. Still in some cases human intervention creates conditions for the steppe grasslands development, mainly by tree cutting and grazing. Thus, in these particular situations, within the Dobrogean wooded steppe habitat, the forest associations may be represented by other plant communities than the ones already mentioned, typical for this layer, or situated at its limit with the xerotherm forests layer. These are represented by the associations from the suballiance, endemic for Dobrogea, *Carpino-Tilienion tomentosae* Doniță 1970, that includes the following associations: *Galantho plicatae-Tilietum tomentosae* Doniță 1970, *Nectaroscordo-Tilietum tomentosae* Doniță 1970, *Querco pedunculiflorae-Tilietum tomentosae* Doniță1970, *Polyquerco-Tilietum tomentosae* Doniță 1970 and *Tilio tomentosae-Carpinetum betuli* Doniță 1968. To this can be added the association *Carici-Quercetum frainetto* Doniță 1970, from the alliance *Quercion farnetto* I. Horvat 1954 nom. mut. propos.

Some of the largest and/or representative areas where this habitat was identified are situated in Tulcea County, on the territories of the following localities: Beidaud, Stejaru, Casimcea, Cerna, Hamcearca, Izvoarele, Nalbant, Frecăței, Babadag, Niculițel, Greci. In Constanța County, this type of habitat is much more restricted than in Tulcea County, being observed mainly in the areas of the communes: Târguşor, Limanu, Ostrov, Băneasa, Adamclisi, Aliman.

Threatened species

In this habitat occur a large number of threatened plant species at the national level, among which we mention only the most characteristic ones, such as:

Potentilla bornmuelleri, Saturea coerulea, Achillea clypeolata, Salvia ringens, Asparagus verticillatus, Ornithogalum fimbriatum, Paeonia peregrina, Myrrhoides nodosa, Pimpinella lithophila, Thymus zygioides, Paliurus spina-christi, Jasminium fruticans, Prunus tenella.

The global importance of this habitat is mainly conferred by the species included in the European Red List, like *Ornithogalum amphibolum, Stipa ucrainica, Moehringia grisebachii, Moehringia jankae, Dianthus nardiformis,* as well as by the taxa mentioned in the Resolution 6/ 1998 – Annex I of the Bern Convention, such as *Campanula romanica* and *Paeonia tenuifolia.*

Among the characteristic fauna 22 globally threatened species were identified.

Geographical distribution

So far this habitat has only been identified in the Dobrogea Plateau. Considering that it is formed by numerous coenotaxa endemic for this region, it will probably not be identified elsewhere. This habitat has a small natural range, both due to its intrinsically restricted area and to its regression as a result of the human activities. Thus, this habitat was initially forming an ecotone area mainly in the peripheric zones of the forest massifs of northern and south-western Dobrogea. As a transition zone between the forests and the much larger steppe area, being situated in easily accessible biotopes, suitable for agriculture and shepherding, it was one of the most transformed habitats, its area being critically reduced.

Component habitats

The habitat is framed into the 93 Wooded steppe, as mentioned in the Resolution 4/1996 of the Bern Convention. This habitat is composed of many habitat subtypes, of which the major part is endemic for the Romanian Dobrogea region.

The endemic forest habitats are mainly represented by 41.73724 Moesian *Galium dasypodium*-white oak woods (*Galio dasypodi-Quercetum pubescentis*) and in particular cases by the following ones: 41.2C22 Moldo-Muntenian sessile oak-hornbeam forests (*Tilio tomentosae-Carpinetum betuli*), 41.76831 Dobrogean paeonia sessile oak forests (*Fraxino orni-Quercetum dalechampii*), 41.76832 Dobrogean sessile oak-lime-oriental hornbeam-ash forests (*Galantho plicatae-Tilietum tomentosae, Nectaroscordo-Tilietum tomentosae*), 41.76833 Dobrogean *Quercus pedunculiflora*-lime-oriental hornbeam forests (*Querco pedunculiflorae-Tilietum tomentosae, Polyquerco-Tilietum tomentosae*).

Endemic shrub and grassland habitats also occur within this wooded steppe type, like 31.8B731 Western Pontic jasmine christ's thorn scrub (*Paliuretum spinae-christi, Rhamno catharticae-Jasminietum fruticantis*) and (within the habitat 34.92 Ponto-Sarmatic steppes) the subtypes 34.9211 Western Pontic thyme steppes (the alliance *Pimpinello-Thymion zygioidi*) and 34.9213 Western Pontic

feathergrass steppes (the regional association *Stipo ucrainicae-Festucetum valesiacae*).

Besides these endemic habitats, others are present in this wooded steppe. These habitats only occur in south-east Romania, especially in Dobrogea region, and in certain areas of Bulgaria. These are mainly represented by the habitats 41.73723 Moesian *Paeonia peregrina*-white oak woods (*Paeonio peregrinae-Carpinetum orientalis*) and 41.7A221 Pontic *Acer tataricum-Quercus pedunculiflora* steppe woods (*Quercetum pedunculiflorae*-syn. *Violo suavis-Quercetum pedunculiflorae*). In rare cases the habitat 41.76813 Moesio-Danubian mixed oak *Quercus frainetto* forests (*Carici-Quercetum frainetto*) may also be present. Another shrub habitat that can occur is the 31.8B71 Ponto-Sarmatic steppe brush (*Prunetum tenellae*).

It is important to mention that, with the exception of the shrub habitats (31.8B731), all the others are endangered, being protected by the Resolution 4/19996 of the Berne Convention, within the upper categories 41.2 Oak-hornbeam forests, 41.7 Thermophilous and supra-Mediterranean oak woods, respectively 34.9 Continental steppes.

To this, there can be added the regional associations specific for this province represented by the *dobrogicum* subassociations of the plant communities *Botriochloetum ischaemi*, *Chrysopogonetum grylli*, *Stipetum capillatae*, *Festucetum valesiacae*, that belong to the alliance *Festucion valesiacae*, included in the habitat 34.92 Ponto-Sarmatic steppes, as well as *Pruno spinosae-Crataegetum* var. geogr. *dobrogensis* (*Prunetum moldavicae*), framed in the 31.8B721 Ponto-Sarmatic hawthorn-blackthorn scrub (Sanda, 1999, Dihoru, 1970, Horeanu, 1976).

The habitat has a small range in Romania, where it occurs only in Dobrogea Plateau, on restricted areas, which makes it very rare at the national and European scales.

Associated habitats

This habitat is associated at the landscape scale with steppe grasslands, shrub and/or habitats from all the types described before, but uniform ones, on large areas, without the typical aspect of mosaic vegetation of the wooded steppe, the associated forest habitats having conventionally a higher coverage than 50%.

Reasons for decline or threats

The habitat is mainly threatened by tree plantations, overgrazing, illegal tree cutting, trampling, quarries. As it is one of the richest in threatened species habitats of Dobrogea, it is also affected by these species gathering.

Protection proposals

The Dobrogean wooded steppe, taking into account that it is a critically threatened and restricted habitat, considering its high conservation value, due to its

threatened species, and endangered component habitats, should be listed in the Official Journal/ Habitat Directive as a priority subtype. Thus it is necessary to protect it all over its natural range, within or outside the protected areas network.

CONCLUSIONS

The two habitats described here for the first time are very distinctive from the other habitats described in the PHYSIS database, taking also into account that they are endemic for Dobrogea region-Romania. Thus we consider that it is necessary to include them as new subtypes within the Palaearctic Classification.

Considering that they are also critically endangered, their restricted geographical distribution and their high conservation value, due to the numerous threatened species and associations, we consider that they should be legally protected as priority habitats at the national and European levels, on all their natural range.

Abbreviations: mss. – manuscript, **syn.** – synonymous.

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