

## OTHER NATURAL HABITATS TYPES (UNDER HABITAT DIRECTIVE 92/43/EEC) IN ROMANIA

Adrian OPREA\*, Ion SÂRBU\*

\*Botanic Garden, „Alexandru Ioan Cuza” University, Iasi, Romania

Corresponding author: Adrian Oprea, Botanic Garden, „Alexandru Ioan Cuza” University, 7-9 Dumbrava Rosie, 700487 Iasi, Romania, tel.: 0040232201373; fax: 0040232201385; e-mail: aoprea@uaic.ro

**Abstract.** New habitat natural types are proposed in this paper. Some of the already existing natural habitats are too largely described in the "Interpretation Manual of European Union Habitats - EUR 27". That why, as a result of a scientific project developed in Romania between the years of 2001 and 2004, namely inventoring the most important plant areas to be preserved in Romania we identified other natural habitats, whose distributions cover pretty large areas in our country. As a result we proposed other 17 new habitats or habitat subtypes to be taken into considerations in the future versions of the "Interpretation Manual of European Habitats".

**Keywords:** natural habitats, biodiversity, Romania

### INTRODUCTION

The geographical position of Romanian territory, situated at the intersection of some biogeographic floristic provinces and regions, alongside with a great variety of the relief forms, constitute the natural factors which has led to a great floristic and phytocoenologic diversity, as well as some peculiar natural habitats, for this part of Europe.

A compared analyse made on the ground of an international scientific project (*Important Plant Areas in Romania*), developed between the years of 2001 and 2004, has determined us to identify some new types of natural habitats, under B” criterion evaluation [1, 10], which are neither included under the Annex I of the "Habitat Directive 92/43/EEC", nor under the "Bern Convention" [13, 15-16]. Certainly, some of these natural habitats types existing in Romania, are already included in some classification units in some papers [8]. But this units of classification are too largely described for to embrace all the specific, as well as some of the local nuances, of the vegetation from this part of Europe.

Thereby, some of the natural habitat types existing in the vegetation of Romania are missing at all from the international documents [2, 13, 15-16]. Also, neither in the romanian literature on habitats, these vegetation types are not yet described [3-6, 11]. Therefore, nor in the romanian legislation is nothing given about these vegetation types [17-18].

These missing habitats have some regional peculiarities, thus characterizing, from a phytogeographic point of view, pretty well large parts of the vegetation in South-East Europe.

### Reasons

Even if there is available the newest version of the "Interpretation Manual of European Union Habitats - EUR 27 (July 2007)" [13], there are still other natural habitats, occupying pretty large areas in Romania, as well as in the Eastern part of Europe, which have no correspondence in this scientific reference document. That's why, we have some new proposals for other

natural habitats, in order to be taken into considerations for future analyses in the Biogeographical Seminars of the European Union.

### Methodology

The plant nomenclature follow *Flora Europaea* (<http://rbg-web2.rbge.org.uk/FE/fe.html>) [14] and [7]. Some of the plant distribution in the newly proposed habitat types follow the well-known "Romanian Flora", tomes I-XIII [9].

The abbreviations used in this paper have the next significations:

- *Pal. Class.* = the code of each natural habitat, sensu *Classification of the Palearctic habitats* [2].
- *Hab. Dir.* = the code of each natural habitat, sensu *Interpretation Manual of European Union Habitats*, v. *EUR 27/2007* following the *Habitat Directive 92/43/EEC* [13].

The columns in Table 1 are to be interpreted as follow:

- Column 1: the currently number of each habitat category
- Column 2: *EUNIS Code*, Level 1 and 2 [20]
- Column 3: *Proposed natural habitat types* – our proposals of the specific natural habitats in Romania
- Column 4: *Equivalence with EUR 27* [13]: in each cell on row no 1 is a code from Habitat Directive 92/43/EEC [16] and on row no 2 is a code from *Palearctic habitats* (Pal. Class.) [2]. These codes in column no 4 correspond to each proposed natural habitat in column no 3.

### RESULTS

17 new natural habitat types are proposed in this paper. All of these natural habitat types are properly named and characterized, from floristic, ecologic, as well as concerning their natural distribution in Romania, point of views. Nevertheless, some of these natural habitat types, could be included in larger units of vegetation, under the "Habitat Directive 92/43/EEC", as subunits (Table 1).

**Table 1.** New habitat types proposed to be protected in Romania and their equivalence with the habitats from the "Interpretation Manual of European Union Habitats - EUR 27" and "Palaeartic habitats".

No. crt.	EUNIS Code		Proposed natural habitat types	Equivalence with EUR 27
	Level 1	Level 2		
0	1	2	3	4
1	B	B1	Plant communities of salty sands on sea beaches with the next plant species: <i>Crambe maritima</i> , <i>Lactuca tatarica</i> , <i>Argusia sibirica</i> , <i>Cakile maritima</i> subsp. <i>euxina</i> , <i>Glaucium flavum</i> , <i>Euphorbia pepelis</i> , <i>Scolymus hispanicus</i> .  Distribution in Romania: along the seashores of Black Sea in Romania.	1. <i>Hab. Dir.</i> : –  2. <i>Pal. Class.</i> : 16.123312 16.12332 16.12333 16.12334
2	C	C1	Plant communities of inland salty waters with the next plant species: <i>Zannichellia palustris</i> subsp. <i>palustris</i> , <i>Chara</i> sp., <i>Entheromorpha intestinalis</i> .  Distribution in Romania: the brackish waters of the lakes and ponds in Romania.	1. <i>Hab. Dir.</i> : –  2. <i>Pal. Class.</i> : –
3	E	E1	West Pontic plant communities of bushes, along the great rivers, on sandy-loams, light salty soils, with the next plant species: <i>Tamarix ramosissima</i> , <i>Salix purpurea</i> , <i>Calamagrostis epigejos</i> , <i>Potentilla reptans</i> , <i>Cynodon dactylon</i> , <i>Poa angustifolia</i> , <i>Galium humifusum</i> , <i>Artemisia santonicum</i> subsp. <i>santonicum</i> , <i>Atriplex prostrata</i> (= <i>A. hastata</i> ).  Distribution in Romania: the riverine vegetation along the rivers on the planes and tablelands of Romania.	1. <i>Hab. Dir.</i> : a subtype to 92D0 Southern riparian galleries and thickets ( <i>Nerio-Tamaricetea</i> and <i>Securinegion tinctoriae</i> )  2. <i>Pal. Class.</i> : 44.8141
4	E	E1	West-pontic sandy beaches with the next plant species: <i>Carex ligerica</i> , <i>Artemisia campestris</i> subsp. <i>lednicensis</i> , <i>Scabiosa argentea</i> , <i>Syrenia montana</i> , <i>Secale sylvestre</i> , <i>Ephedra distachya</i> , <i>Koeleria glauca</i> s.l., <i>Onosma arenaria</i> , <i>Euphorbia seguierana</i> , <i>Festuca arenicola</i> , <i>Festuca beckeri</i> , <i>Festuca polesica</i> , <i>Bassia laniflora</i> , <i>Verbascum banaticum</i> , <i>Centaurea arenaria</i> , <i>Dianthus bessarabicus</i> s.l.  Distribution in Romania: sandy grey dunes in Dobrudja and sandy beaches along the Black Sea shores in Romania.	1. <i>Hab. Dir.</i> : –  2. <i>Pal. Class.</i> : 16.22B121 16.22B122
5	E	E1	West-pontic steppe meadows, with xerophilous plant species, as: <i>Stipa ucrainica</i> , <i>Stipa lessingiana</i> , <i>Stipa. capillata</i> , <i>Festuca valesiaca</i> , <i>Taraxacum serotinum</i> , <i>Centaurea orientalis</i> , <i>Convolvulus cantabrica</i> , <i>Centaurea rutifolia</i> subsp. <i>jurineifolia</i> , <i>Galium octonarium</i> , <i>Dichanthium ischaemum</i> , <i>Agropyron cristatum</i> subsp. <i>pectinatum</i> , <i>Teucrium polium</i> subsp. <i>capitatum</i> , <i>Galium moldavicum</i> , <i>Pulsatilla vulgaris</i> subsp. <i>grandis</i> (without <i>Paeonia tenuifolia</i> ).  Distribution in Romania: xerophile meadows in South and East part of Romania (including Dobrudja).	1. <i>Hab. Dir.</i> : a subtype to the habitat 62C0* Ponto-Sarmatic steppes  2. <i>Pal. Class.</i> : 34.921
6	F	F4	Dobrogean xerophilous stone meadows, from <i>Pimpinello-Thymion zygoidi</i> , with the next plant species: <i>Thymus zygoides</i> , <i>Agropyron brandzae</i> , <i>Agropyron ponticum</i> , <i>Pimpinella tragium</i> subsp. <i>lithophila</i> , <i>Koeleria lobata</i> , <i>Dianthus nardiformis</i> , <i>Dianthus pseudarmeria</i> , <i>Festuca callieri</i> , <i>Centaurea jankae</i> , <i>Artemisia lerchiana</i> .  Distribution in Romania: stone meadows in Dobrudja (Romania).	1. <i>Hab. Dir.</i> : a subtype to the habitat 62C0* Ponto-Sarmatic steppes  2. <i>Pal. Class.</i> : 34.921
7	F	F6	Transylvanian forests of hornbeam and oak, edified by <i>Carpinus betulus</i> and <i>Quercus petraea</i> , being characterized by: <i>Melampyrum bihariense</i> , <i>Lathyrus hallersteinii</i> and so on, in the herbaceous layer.  Distribution in Romania: forests of Transylvania (Romania).	1. <i>Hab. Dir.</i> : a subtype to 91Y0 Dacian oak & hornbeam forests  2. <i>Pal. Class.</i> : 41.2C11 41.2C12
8	G	G1	Subtermophilous forests and bushes, with the next plant species: <i>Carpinus orientalis</i> , <i>Fraxinus ornus</i> , <i>Syringa vulgaris</i> , <i>Veronica spicata</i> subsp. <i>crassifolia</i> , <i>Tulipa hungarica</i> , <i>Echinops bannaticus</i> , <i>Delphinium fissum</i> .  Distribution in Romania: South-West part of Romania (Banat).	1. <i>Hab. Dir.</i> : a subtype to the habitat 40A0* Subcontinental peri-Pannonic scrub  2. <i>Pal. Class.</i> : 31.8B12p, 31.8B13, 31.8B14, 31.8B3p
9	G	G1	Mixed forests of beech and hornbeam, on hills and submontane area, with the next plant species: <i>Carex pilosa</i> , <i>Helleborus purpurascens</i> , <i>Galium schultesii</i> , <i>Cardamine glanduligera</i> .  Distribution in Romania: hills and submontane area of Romania, in all the historical provinces.	1. <i>Hab. Dir.</i> : a subtype to 91V0 Dacian Beech forests ( <i>Symphyto-Fagion</i> )  2. <i>Pal. Class.</i> : 41.1D2
10	G	G1	Moldavian hilly forests with hornbeam and oaks ( <i>Quercus robur</i> , <i>Quercus pedunculiflora</i> ) and hornbeam with durmast ( <i>Quercus dalechampii</i> ), with the next plant species: <i>Tilia tomentosa</i> , <i>Carex brevicollis</i> , <i>Carex pilosa</i> , <i>Scutellaria altissima</i> , <i>Lathyrus venetus</i> , <i>Asparagus tenuifolius</i> , <i>Piptatherum virescens</i> .  Distribution in Romania: hilly forests of Moldavia (Romania).	1. <i>Hab. Dir.</i> : a subtype to 91Y0 Dacian oak & hornbeam forests  2. <i>Pal. Class.</i> : 41.2C2

0	1	2	3	4
11	G	G1	Moldavian hilly beech forest, characterized by the next plant species: <i>Fagus taurica</i> , <i>Fagus orientalis</i> , <i>Fagus sylvatica</i> , <i>Tilia tomentosa</i> , <i>Cardamine quinquefolia</i> , <i>Scutellaria altissima</i> , <i>Lathyrus venetus</i> , <i>Asparagus tenuifolius</i> , <i>Carex brevicollis</i> .  Distribution in Romania: hilly forests of Moldavia (Romania).	1. <i>Hab. Dir.</i> : a subtype to 91V0 Dacian Beech forests ( <i>Symphyto-Fagion</i> )  2. <i>Pal. Class.</i> : 41.1D61
12	G	G1	Moesian forests of hornbeam with durmast and hornbeam with oak, characterized by the next plant species: <i>Quercus robur</i> , <i>Quercus polycarpa</i> , <i>Quercus dalechampii</i> , <i>Quercus pedunculiflora</i> , <i>Carpinus betulus</i> , <i>Tilia tomentosa</i> , <i>Fraxinus angustifolia</i> , <i>Carpesium cernuum</i> , <i>Scutellaria altissima</i> , <i>Helleborus odoratus</i> , <i>Asperula taurina</i> subsp. <i>leucanthera</i> , <i>Galium pseudaristatum</i> , <i>Luzula forsteri</i> , <i>Potentilla micrantha</i> , <i>Genista tinctoria</i> subsp. <i>tinctoria</i> and <i>Lathyrus venetus</i> .  Distribution in Romania: South and West parts of Romania (Oltenia and Banat historical provinces).	1. <i>Hab. Dir.</i> : subtype to 91Y0 Dacian oak & hornbeam forests  2. <i>Pal. Class.</i> : 41.2C
13	G	G1	South-east european subtermophilous forests, edified by the next plant species: <i>Quercus pedunculiflora</i> , <i>Quercus cerris</i> , <i>Quercus pubescens</i> with <i>Helleborus odoratus</i> , <i>Lathyrus niger</i> , <i>Ruscus aculeatus</i> , <i>Potentilla micrantha</i> , <i>Lychnis coronaria</i> , <i>Carex precox</i> , <i>Tanacetum corymbosum</i> , <i>Doronicum hungaricum</i> , <i>Sedum cepaea</i> , <i>Paeonia peregrina</i> , <i>Dictamnus albus</i> , <i>Vinca herbacea</i> , <i>Buglossoides purpureocaerulea</i> , spread in the southern part of Romania, from Calafat, in the West to Bucharest, in the East, and partly in Bărăgan.  Distribution in Romania: South and West parts of Romania (Oltenia and Banat historical provinces).	1. <i>Hab. Dir.</i> : a subtype at 91M0 Pannonian-Balkan turkey oak - sessile oak forests  2. <i>Pal. Class.</i> : 41.76
14	G	G1	Ponto-balkan forests, with the next plant species: <i>Quercus pedunculiflora</i> , <i>Quercus pubescens</i> , <i>Acer tataricum</i> , <i>Cotinus coggygria</i> , <i>Fraxinus ornus</i> , <i>Carpinus orientalis</i> , <i>Paeonia peregrina</i> , <i>Asparagus tenuifolius</i> , <i>Asparagus verticillatus</i> , <i>Arum orientale</i> , <i>Vinca herbacea</i> , <i>Myrrhoides nodosa</i> .  Distribution in Romania: Southern part of Romania.	1. <i>Hab. Dir.</i> : a subtype at 91AA* Eastern white oak woods  2. <i>Pal. Class.</i> : 41.7371, 41.7372
15.	G	G1	Submediterranean bushes with <i>Paliurus spina-christi</i> .  Distribution in Romania: the historical provinces of Dobrudja and Banat (Romania).	1. <i>Hab. Dir.</i> a subtype at 40C0* Ponto-Sarmatic deciduous thickets  2. <i>Pal. Class.</i> : 318B731
16	G	G3	South-East Carpathians acidophylous forests of Scottish pine ( <i>Pinus sylvestris</i> ), mixed up with durmast ( <i>Quercus petraea</i> ) and Norway spruce ( <i>Picea abies</i> ), having in the herbaceous layer species characteristics for spruce forests, and also some herbaceous species from the broad-leaved forests, like: <i>Luzula luzuloides</i> , <i>Poa nemoralis</i> , <i>Galium odoratum</i> , <i>Rubus hirtus</i> . In the moss layer <i>Leucobryum glaucum</i> , <i>Dicranum scoparium</i> and <i>Hypnum cupressiforme</i> are dominant species.  Distribution in Romania: Romanian South-East Carpathians, on acidophylous soils.	1. <i>Hab. Dir.</i> : a subtype at 91Q0 Western Carpathian calcicolous <i>Pinus sylvestris</i> forests  2. <i>Pal. Class.</i> –
17	H	H3	Dobrogean rock vegetation, with the next plant species: <i>Campanula romanica</i> , <i>Moehringia grisebachii</i> , <i>Moehringia jankae</i> , <i>Iberis saxatilis</i> , and <i>Notholaena marantae</i> .  Distribution in Romania: the historical province of Dobrudja (Romania).	1. <i>Hab. Dir.</i> : a subtype at 8210 Calcareous rocky slopes with chasmophytic vegetation  2. <i>Pal. Class.</i> : 62.1

## DISCUSSIONS

In the newest version of the "Interpretation Manual of European Union Habitats - EUR 27 (July 2007)", some of our proposals could be recognized in some of the habitats already described there (see Table 1). But, in some cases, some of the habitats have a pretty large interpretation: for instance, the natural habitat "91I0\* Euro-Siberian steppic woods with *Quercus* spp.", has a quite large and general description, so that it is very difficult to have so many oak species, so much varied from ecological point of view, in a single natural habitat. In other cases, on the contrary, some of the natural habitats are described in a pretty narrow interpretation. Ex. the natural habitat "91X0\* Dobrogean beech forests".

Sometimes, it is very difficult for anyone to recognize a certain habitat from Romania in the *Interpretation Manual of European Union Habitats - EUR 27*. For instance, those plant communities of bushes from Romania, having a natural spreading along the great rivers, situated on sandy-loams, or light salty soils, with the next plant species: *Tamarix ramosissima*, *Calamagrostis epigejos*, *Potentilla reptans*, *Cynodon dactylon*, *Poa angustifolia*, *Galium humifusum*, *Artemisia santonicum* subsp. *santonicum*, *Atriplex prostrata* (= *A. hastata*), are to be framed by us, under the habitat "92D0 Southern riparian galleries and thickets (*Nerio-Tamaricetea* and *Securinegion tinctoriae*)", accordingly to this new manual. And this is quite difficult to act like this, due to the fact that, in the romanian flora, is growing another species, namely *Tamarix ramosissima* (not *Tamarix smyrnensis* as it is

stated in [13], in an incorrect way), and there are not met in the flora of Romania those southern plant species (ex. *Nerium oleander*, *Vitex agnus-castus*, *Securinega tinctoria*, *Prunus lusitanica* and *Viburnum tinus*), which characterize the above mentioned natural habitat.

Also, the reedbeds and bulrush beds, occupying large areas in Romania (for instance into the Danube Delta, and along the rivers, and on the border of lakes, ponds, and so on), are not yet comprises in this new "Interpretation Manual of European Union Habitats" [13] (it has to be defined an other category in the next future for this kind of vegetation).

Taking into account all of these reasons, we have made ourselves new proposals for other natural habitats existing in Romania, in order to improve next issues of the "Interpretation Manual of European Union Habitats".

Having in mind these proposals of new natural habitat types in Romania, one can accept that they are more or less typical for the South-East part of Europe, meaning here an acceptance of a high degree of biodiversity at the scale of the whole Europe. It will impose taking other steps in order to preserve the Nature, as a whole.

Those 17 proposed new habitats could represent other contributions of the romanian botanists to the improving the next issues of the *Habitat Directive 92/43 of European Union*.

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