

*Contribuții Botanice, XLIII, 2008*  
Grădina Botanică “Alexandru Borza”  
Cluj-Napoca

## NATURAL BIODIVERSITY ASPECTS AND NATURE PROTECTION IN DOBRUDJA

*Adrian BAVARU, Rodica BERCU*

Faculty of Natural and Agricultural Sciences, Department of Biology  
„Ovidius” University 124, Mamaia str. **RO-900527, Constanța, Romania**  
**e-mail:** rodicabercu@yahoo.com

**Abstract:** Dobrudja has numerous protected areas, some of them unique for our country. Today, in Constanta county we have 37 natural reserves and nature monuments and in Tulcea county, 34 protected areas (including the Danube Delta Biosphere Reserve) and the famous Măcin Mountains National Park, being the largest and interesting protected terrestrial area (11,321 ha) of Dobrudja. In this paper is presented the origin of Dobrudja flora and fauna and their capitalisable potential. In the article, are reminded the most characteristic areas together with their characteristic aspects and environmental and biodiversity protection problems. The rare plant and animal species, typical for these places, are illustrated by photographs. Finally, some recommendations, concerning the future measures for an efficacious protection of these natural beauties, are made. These measures are necessary to be known by the local and central forums, so the specific natural zones from this places to be protected indeed.

**Key words:** biodiversity, Dobrudja, environment, fauna, flora, protection, preserve, reserve, species.

### **Introduction**

Some years ago together with some colleagues, I wrote a book entitled “Nature monuments and beauties of Constanta County”. In this book we tried, for the first time, to get together in a unique paper the natural biodiversity and protection aspects from the South Dobrudja area. In the near future we will try to update and republish it. In this paper we would like to present some data about the floristic, faunistic and the landscape architecture biodiversity value of Dobrudja and finally to refer to some protected unique areas not only for Dobrudja County but also for Romania.

This land between waters, Dobrudja, represents, from the faunistic and floristic biodiversity point of view, a land with a peculiar character, characteristic not only for our country but also for the south-east Europe. In the past, but also nowadays, it was visited by numerous Romanian and foreign botanists, zoologists who worked here and collected an ample documentary material and appreciated this region as unique for its heterogeneity of the floristic variety, for its specific fauna and, never the less, for its peculiar biodiversity. That is why Prof. Ion Ionescu de la Brad, the founder of the Romanian Agricultural School of the Romanian Countries, visiting Dobrudja in the middle of the 19<sup>th</sup> century, appreciated in his paper „Excursion agricole dans la plaine de la Dobrudja”, published in 1850, that this area, by its climatic conditions, may be „the Romanian California”. The harmony among this land’s ecosystems and their impressiveness biodiversity entails their conservation and generally the nature protection and the maintaining of the natural parameters so necessary for life on Earth.

In our country, there is a legislation concerning the environmental protection and nature conservation, which, we may say is corresponding to that of the European one. The ministers, the central institutions and other decision organisms could not always carry into effect the legislation and transform it into an efficacious activity which can be found in the territory. We try, by our preoccupations, to sensitize the local and central forums, so the specific natural zones from the two Dobrudja counties (Constanța and Tulcea) to be protected indeed (not only on the paper). We must underline that some areas possess a large special natural diversity; they are unique for

our country (the maritime dunes of Agigea, “La Movile” cave, The Marine Littoral Aquatory VamaVeche–2 Mai and the famous Danube Delta Biosphere Reserve).

### Discussion

In Constanța county are declared about 37 protected areas together with the natural monuments and in Tulcea county there are 34 natural reserves (including the Danube Delta Biosphere Reserve), the Măcin Mountains National Park, being the most important terrestrial protected area from the entire Dobrudja (11,321 ha.) [2, 7].

In the literature of the early XIX century, the authors divided Dobrudja into two forester zones: one in the North, occupied by Babadag and Casimcea plateau and the other in the South-West part belonging to Deliorman Forest, being connected, across the Danube, with Vlăsiei Forest. The necessity for agricultural and depasturage territories devastated this forests and appreciably reduced them. In the land clearing forests appeared a steppe vegetation which existed long time ago together with the forests, known by Ovidius descriptions in the immortal “Tristia and Epistulae ex Ponto”, consisting a large variety of unique and rare species for our country fauna and flora [1, 8].

In its diversity and profusion, Dobrudja flora is like that of the Mediterranean islands, is richer than that of Crimea and twice richer than the Moldova Republic flora. Its peculiar character and value is due to the interconnection, in a restricted space, of a great number of floristic elements from multiple geographical regions. Most of Pontic elements of our country flora are in Dobrudja. Here it can be also found a high percent of Mediterranean, sub Mediterranean, Balkan, Illyric, Sarmatic, Tauric, Pontic species etc., most of them rare and other endemic or they have here areal limits (the case of *Convolvulus persicus* L., *Potentilla bifurca* L., the West limit or *Silene compacta* Fisch., its North limit being in Dobrudja) [1, 8].

The evaluation of the capitalisable potential of Dobrudja species is another important aspect for a good management. In many states start the investigation programs for the identification of that species which have a biochemical, pharmaceutical or alimentary potential. Another category of species of economical interest is represented by those with a large natural resistance to pests and diseases. The application of some hybrids, starting from such a population, will represent the premise of an ecological agriculture avoided by chemical control and a modern zootechny. There are also species which are in the local community attention for certain traditional employment and this way is important to maintain them (Russian villages from the North Dobrudja).

It must not be forgotten that a species can't resist among isolated individuals for a long time but through the populations. The protection of some isolate individuals has few chances to succeed for a long period of time. An efficient protection consisting of a durable development must include the entire assemble in which the respective species populations live and if is possible the entire ecosystem.

This way, we must remind the failure of years '70 when in the South of Dobrudja (especially in Hagieni reserve) had been brought many typical reptile species (especially lizards) for Ada-Kaleh island which had been drown by the water of the accumulation lake and those from Agigea Reserve with the displaces, from this reserve, in the south littoral zone of some remarkable flora species specimens in a moment when the most part of its territory was transferred for the construction of the great Constanta Sud-Agigea Port, remaining only 8 ha instead of 25 that were at its establishment [1, 8].

In comparison with Dobrudja specific flora, the terrestrial and peculiar fauna as well, consists of a lot of elements of south, Ponto-Caspic, Mediterranean and Euro Asiatic origin is almost unknown. If the vertebrate fauna: fishes, amphibians, reptiles, birds and mammals are well known, things are different with the invertebrate group and the future will reserve many surprises to a systematic study. Few groups have been seriously studied for example the

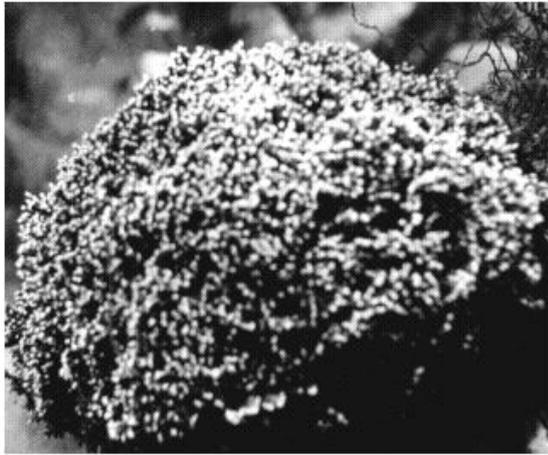
gastropods (the snails), bivalve (the shells), or insects: lepidopterans (the butterflies) and coleopterans (the beetles). Unfortunately, the entire invertebrate groups are few familiar or unknown. From the insects we can mention large orders such as: hymenopterans (the hornets), Araneae species (spiders) and Acaria (ticks and mites), nematodes (roundworms), terrestrial Oligocheta (annelid worms) and the boscage fauna from the Dobrudja forests. Altogether, in each of studied invertebrate group, had been identified endemic rare or new scientific species. For example, in the last 40 years, in Lepidoptera group had been found almost 40 species new for Romania and in the last five years were described, in Dobrudja, two new scientific species [1].

After a short presentation of some general aspects concerning the Dobrudja natural biodiversity and the problems of its protection and preservation, we would like to stop on two natural apart Reserves - unique for our country – the famous “Orbanul Mare-La Movile” cave from Mangalia which, by the general surprises, distinguished an unexplored habitat – the cavernous environment from the karsts which lies under all South Dobrudja where fauna is unique by its relict character [3, 4]. In “La Movile” cave have been discovered not only invertebrate species, which from Tertiary evolved in isolation condition, but also an interesting ecosystem which, for its survive, do not need sun energy but is based on bacterial degradation processes. From this cave, accidentally discovered in 1986, tight closed with any possibility to communicate with the exterior, had been described 46 invertebrate species: millipedes, isopods, shell-fishes, chelicerae arthropods (spiders, pseudo scorpions), collembolan, heteroptera species (bed bugs) etc., 29 of them are new science species. The specialists estimate that “Orbanul Mare-La Movile” fauna evolved in isolation condition from Miocen, for almost 5.2 million years. This underground archaic fauna has some morpho-anatomical adaptations such as the entire discoloration, the disappearance or regress of the visual organ etc. There are taxa that these adaptations may be found to adults; the forenamed are maintained also to juvenile forms. On the other hand, certain zones of the cave are populated by bacterial communities adapted to develop in the absence of oxygen – chemoautotrophic – similarly with those discovered on the bottom of the ocean in the hydrothermal springs. It is estimated that these organism types may resist in other planets or satellite condition larger than the solar system (Jupiter or Mars satellite). The study of a fountain from Mangalia zone, discovered after the “La Movile” cave, identified a fauna close to that of the cave one. However, a thoroughly and systematic study of this fauna almost lack due to the extent of the karstic system and the surprises may be not excluded. This invertebrate small fauna preserves many primitive characters compared to the surface fauna which is forced to accommodate to the environmental modifications [3, 4].

Because we are in the South of Dobrudja, we must mention another natural reserve – singular for our country „The Marine Littoral Aquatory VamaVeche–2 Mai” (excluding the littoral zone) with 5,000 ha surface and with an extension lies of 7 km shore. In 1980, when it had been put on protection, was included also the littoral zone. Now by 5/2000 law ”somebody” took care to pull out the littoral zone and to move the reserve surface to 6 m offshore (3150 ha), practically the most interesting zone for it peculiar marine flora and fauna (until 6 m depth range), such as the littoral sands was pull out of special protection becoming so called „buffer zone”, almost 1,850 ha. The 2 Mai and Vama Veche municipal councils, together with numerous investors, full of money and „magnificent plans”, are preparing to transform this part of littoral, less affected by the human input influence, by their interest. This thing had been made with the tacit agreement of the county authorities. No comment [9].

We still believe that the entire surface of 5,000 ha, including the littoral zone, must be a constitutive part of the reserve but we will agree with the touristic buildings and pleasure ports fittings out but not with industrial constructions, and the used waters to be collected and not slopped in the sea – such as is practice today.

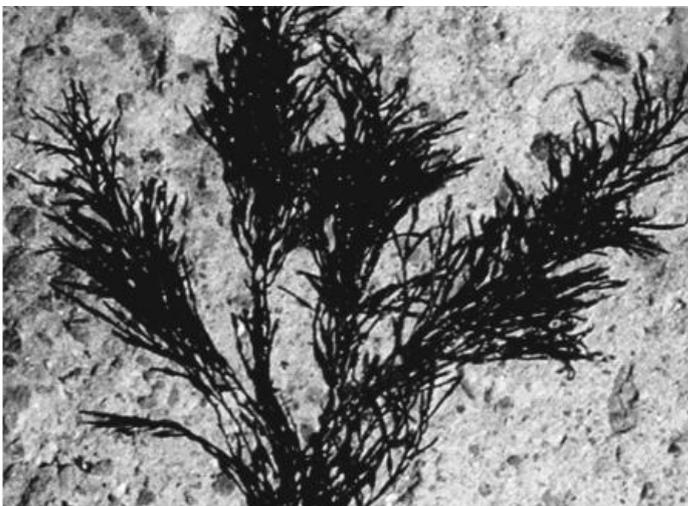
PLATE 1



*Corallina officinalis* L.



*Callithamnion corymbosum* (Smith) Lyngbye



*Cystoseira barbata* (Good. et Wood.) Ag.



*Syngnathus typhle* L.



*Convolvulus persicus* L.



*Ephedra distachya* L.



*Allysum borzeanum* Nyar.

PLATE 2



*Crambe maritima* L.



*Cakile maritima* Scop.,  
subsp. *euxina* (Pobed.) Nyár.



*Asphodeline lutea* (L.) Reich.



*Paliurus spina-christi* Mill.



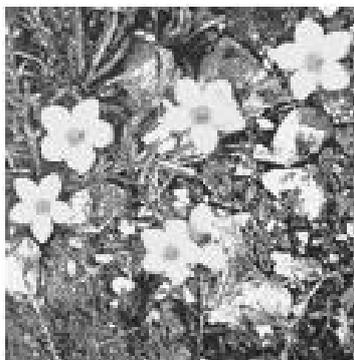
*Galanthus plicatus* Bieb.



*Galanthus elwesii* Hook.



*Ruscus aculeatus* L.



*Linum pallasianum* subsp.  
*borzaeanum* (E.I. Nyárády) Petrova



*Crocus pallasii* L.

This aquatory, by its specific nature condition, have some species which can't be found in the north zones. However, here from the north arrived and were collected algae species such as from the calcareous red algae *Corallina officinalis* L., *Callithamnion corymbosum* (Smith) Lyngbye a red alga too, both missing to the north. Here are reduced tufts of *Cystoseira barbata* (Good. et Wood.) Ag. and *C. crinita* (Desf.) Duby f. *bosphorica* A.Zin. et Kalug which disappeared in Constanța zone, and the red free-floating alga belonging to *Phyllophora* genus.

Concerning the fauna we still may find a shell-fish *Xantho poressa*, Olivii, 1792 mentioned also in the „Red Book” (vulnerable species for the Black Sea), such as another rare one *Pilumnus hirtellus* Stimpson, 1858. We may mention here some fishes species: the spiny dogfish (*Acipenser stellatus* Pallas, 1771), the thornback ray and the common stingray (*Raja clavata* L., 1758, *Dasyatis pastinaca* L., 1758). Among *Cystoseira* clusters we find the common seahorse (*Hippocampus ramulosus* Leach, 1814) and species of pipefish (*Syngnathus typhle* L., 1758, *S. variegatus* Pallas, 1814, *Nerophis ophidian* L.) [5, 6].

Rare isopod species were found in the deep ranges such as *Upogebia pusilla* Petanga, 1792 and *Ophelia bicornis* Savigny, 1818. A group of zoologists from our faculty found here, for the first time on our sea shore, two species of turbellarians *Monocelis lineate*, Müller, 1774 and *Archylina endostya* Ax 1959 and polychaet worms *Syllis hyaline*, Grube 1863 and *Grubea tennicirrata* Claparède, 1864. Recent, here was found, in 5-6 m depth range, an invasive species, namely the blue American crab - *Callinectes sapidus*, Rathbun 1896 [5, 6].

The extended denudate zone, on the stone platform from the North, is the proof of the continuous modification processes of the rocky habitats from our littoral. Nearby Mangalia port there is already a selenary zone without any organisms due to the high pollution in the area.

### Conclusions

Natural ecosystems biodiversity from Dobrudja is highly perturbed in the last period of time by human negative impact which gradually generates the nature weakness, a strong reason for a major and acute preoccupation concerning their protection. Protection can be fulfilled only by juridical, administrative and educative measures association. Changing the human mentality regarding the nature is not easy (especially concerning the businessmen) and without an education, in the true meaning of the word, any action in environmental and biodiversity protection is submissive to defeat.

The biodiversity conservation in Dobrudja, especially that of the natural scientific reserves, confirms our contribution in international cooperation in saving the endangered natural ecosystems.

### REFERENCES

1. Bavaru, A., Arcuș, M., Skolka, M., 2003, Zone umede și arii protejate din județul Constanța. In: „*Noi profesioni de mediu-educație ecologică*”, “Ovidius” University Press, Constanța: 65-84.
2. Bleahu, M., 2004, *Arca lui Noe în secolul XXI. Ariile protejate și protecția naturii*, Ed. Națională, București: 443-444, 463-464, 478-479.
3. Boghean, V., Racoviță, G., 1989, Données préliminaires sur le topoclimat de la grotte „Peștera de la Movile” Mangalia de Sud, Roumanie, *Misc. Speol. Rom.*, 1: 19-32.
4. Constantinescu, T., 1989, Considérations sur la zone karstique de “La Movile”, *Misc. Speol. Rom.*, 1, București: 89-197.
5. Gomoiu, T.M., 1978, Câteva probleme privind protecția geofondului Mării Negre, *Ocrot. Nat. Med. Inconj.*, Ed. Acad. Române, București, 34 (1-2): 11-20.
6. Gomoiu, M.T., Skolka M., 1996, Changements récents dans la biodiversité de la mer Noire dûs aux immigrants. In: Malița, M., Gomoiu, T.M., Panin, N., (eds.), „*Geo - Eco - Marina*”, București-Constanța, 1: 49 – 66.
7. Moș, A., Drăgoi, M., Gureanu, D., Don, I., Petrescu, M., 2003, Rezervația Biosferei Delta Dunării. Parcul Național Munții Măcinului. In: Munteanu, D., Mihăilescu, S., Coldea, Gh., (eds.), “*Parcuri naționale, naturale și Rezervații ale Biosferei din România*” MAPAM, Ed. Expert, București: 6-12, 79-82.

8. Sălăgeanu, Gh., Bavaru, A., Fabritius, K., 1978, *Rezevații, monumente și frumuseți ale naturii din județul Constanța*, Ed. Complexul Muzeal de Științe ale Naturii, Constanța: 13-19, 22-27.
9. \*\*\*Rapoarte de cercetare I.N.C.D.M. Constanța. regulamentul Rezervației Acvatoriul litoral marin Vama Veche – 2 Mai, I.N.C.D.M., 2000-2005.

## ASPECTE ALE BIODIVERSITĂȚII NATURALE ȘI OCROTIRII NATURII DIN DOBROGEA

### (Rezumat)

Teritoriul Dobrogei adăpostește o biodiversitate extrem de variată, cu numeroase specii rare, unele endemice atât din floră cât și din faună.

În cele două județe din Dobrogea se găsesc, până la această dată 71 de arii protejate dintre care 37 se găsesc în județul Constanța și 34 în județul Tulcea. Unele dintre acestea sunt unice pentru țara noastră: Rezervația Biosferei Deltei Dunării (județul Tulcea), Acvatoriul litoral marin Vama Veche- 2 Mai, Peștera Orbanul mare-“La Movable” etc.

Flora dobrogeană este extrem de bogată și variată. Într-un spațiu relativ restrâns sunt prezente numeroase elemente floristice din regiuni geografice variate: elemente pontice (toate elementele pontice din România sunt și în Dobrogea), balcanice, mediteraneene și submediteraneene, ilirice, taurice etc.

Fauna are și ea numeroase specii rare cu elemente și aici de origine sudică (mediteraneene, submediteraneene, dar și ponto-caspice precum și euro-asiatice).

Biodiversitatea marină de la litoralul românesc al Mării Negre este și ea în regres. Pentru flora algală unele forme cosmopolite (euriterme și eurihaline) dau cantități mari de biomasă algală în special în sezonul estival (specii ale genului *Cladophora*, *Enteromorpha* sau *Ceramium*). Calitativ, lista speciilor de alge este în reducere. La fel stau lucrurile și cu fauna litorală și mai ales ichtiofauna. Toate acestea ne obligă să acordăm o atenție specială zonei de protecție “Acvatoriul litoral marin Vama Veche- 2 Mai”.

În general, biodiversitatea ecosistemelor naturale din întreaga Dobrogea a fost puternic perturbată în ultimul timp de influența negativă antropogenă, care a dus la “oboseala naturii”, motiv pentru care ocrotirea acesteia trebuie să fie acum o preocupare majoră. Acest lucru este posibil numai prin asocierea măsurilor de ordin juridic și administrativ, cu cele de ordin educațional.