

THE REASONS IN FAVOUR OF SETTING UP A NEW NATURAL RESERVE IN THE BLACK SEA SHORE AREA BETWEEN NORTH AND SOUTH EFORIE (CONSTANTA COUNTY)

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ABSTRACT: In the Romanian Black Sea shore area between North and South Eforie, c. 15 kilometers south from Constanta city, lies a floristically interesting area. Here, on mobile or fixed sand dunes, large populations of many rare psamophilous species occur (*Cakile maritima* ssp. *euxina*, *Elymus farctus* ssp. *bessarabicus*, *Silene thymifolia*, *Eryngium maritimum*, *Glaucium flavum*, *Polygonum maritimum*, *Gypsophyla perfoliata*). Some of them have sporadically spread in the rest of littoral area. These species are included in different IUCN categories in the Romanian Red Lists. The high percentage of rare and threatened species (18.29%), higher than in other southern protected seashore areas (Agigea, 2 Mai -Vama Veche), demonstrates the floristic importance of this site. In the area studied are also some dune habitat types of European conservation interest, which are included in the Habitats Directive and Bern Convention. The beginning of some building works, even in the dune habitats, threatens with extinction the specific psammophilous flora and plant communities. On the base of these evidence we propose the setting up of a Natural Reserve in this area, preferably as part of the Natura 2000 protected areas network.

Introduction

The diversity of natural habitats from seashore area, the specific climate and soil types allow the development of numerous plant species, many of them rare in Romanian flora. The conservation of this floristical richness is achieved in acceptable conditions only within protected areas from the north side of Romanian Black Sea shore (Chituc sandbank and Danube Delta). As regards the southern seacoast (Cape Midia –Vama Veche), it is important to mention that the last “oases” of psamophilous vegetation are seriously affected by human activities. We observed such situation between North and South Eforie (Fig.1), about 15 km south from the city of Constantza. Here, on mobile or fixed sand dunes, large populations of many rare psammophilous species occur. The beginning of some building works, even in the dune habitats (Fig. 2) threatens the special flora and plant communities with extinction. In the area studied, some dune habitat types of European interest for conservation included in the Habitats Directive and Bern Convention are also endangered.

This paper aims to stress the floristic importance of this area and to present some scientific data in support of setting up of a new Natural Reserve, preferably as part of the Natura 2000 protected areas network. Talking into account the above observations, the dune habitats would be preserved - and at the same time certain numerous species that are included in the Romanian Red Lists.



Fig. 1 – The geographical position of the area studied (44° 05' N latitude and 28° 40' E longitude)



Fig. 2 – The building works in the proximity of sand dunes area between North and South Eforie

Materials and Methods

The floristic inventory was carried out on the basis of our observations over the last five years in the seashore area between North and South Eforie. Among all the taxa identified, the rare and threatened plants have been selected (in accordance with Romanian Red Lists) and their percentages compared with those of other seacoast Protected Areas (Agigea, Vama Veche) [3, 8, 11, 12, 13, 14].

Results and Discussion

The floristic inventory contains 142 taxa (130 species and 12 subspecies). Among these, 7 taxa are Endangered (4.92 %), 14 are Vulnerable (9.85 %) and 5 taxa are Rare (3.52 %), in accordance with Romanian Red Lists [2, 5, 9, 10]. Compared with the general situation of Romanian seashore, where the percentage of rare and threatened species is 20.22 % [6], the proportion of these plants categories is lower (18.29 %) in the study area.

Table 1 – The rate of rare and threatened taxa from some Romanian Black Sea coast areas (E – endangered; V - vulnerable; R – rare)

Compared southern Romanian sea coast areas	The number of taxa	Rare and threatened taxa (%)	IUCN plant categories		
			(E) (%)	(V) (%)	(R) (%)
North Eforie-South Eforie	142	18.29	4.92	9.85	3.52
Agigea sand dunes Reserve (Mititelu et al., 1992)	458	11.79	3.05	4.36	3.93
2 Mai-Vama Veche seashore area (Pop I., 1969, 1970, 1985)	137	10.21	4.37	4.37	1.45
All Romanian sea coast area (Făgăraș, 2004)	702	20.22	4.41	6.83	8.54

Pointing to the percentage of Endangered and Vulnerable plants, we have to mention that these are higher (Tab.1), and it is just these IUCN plant categories that are the most threatened by the disturbance influence of human activities.

In the area studied, the rate of Vulnerable and Endangered species is higher than in some Protected Areas such as the Agigea sand dunes Reserve and the 2 Mai-Vama Veche seashore area (Fig.3). This evidence emphasizes the floristic importance of this area and is a significant reason for setting up a Natural Reserve between North and South Eforie.

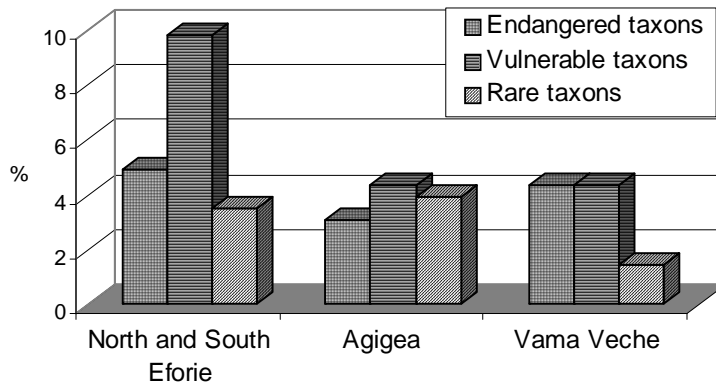


Fig. 3 – The proportion of the main IUCN plant categories in the study area, Agigea sand dunes Reserve and Vama Veche sea coast zone

The plants taxa identified in the study area are as follows (with Rare, Vulnerable and Endangered taxa indicated by bold): *Achillea setacea* Waldst. et Kit., *Althaea officinalis* L., *Alyssum hirsutum* Bieb. [R], *Alyssum desertorum* Stapf, *Amaranthus retroflexus* L., ***Anchusa thessala*** Boiss. et Spruner [E], *Apera spica-venti* (L.) Beauv. ssp. *maritima* (Klokov) Tzvelev, *Artemisia austriaca* Jacq., *Artemisia santonica* L. ssp. *monogyna* (Waldst. et Kit.) Leonova, ***Artemisia tschernieviana*** Besser [V], *Arctium lappa* L., ***Argusia sibirica*** (L.) Dandy [V], *Asperugo procumbens* L., ***Astrodaucus littoralis*** (Bieb.) Drude [E], *Atriplex tatarica* L., *Atriplex sagittata* Borkh., *Atriplex oblongifolia* Waldst. et Kit., *Ballota nigra* L., ***Bassia hirsuta*** (L.) Ascherson [V], *Bassia prostrata* (L.) G. Beck, *Bassia scoparia* (L.) Voss, *Berteroa incana* (L.) DC., *Bromus*

hordeaceus L., *Bromus sterilis* L., *Bromus squarrosus* L., *Bromus tectorum* L., ***Cakile maritima*** Scop. **ssp. *euxina*** (Pobed.) E.I.Nyárády [V], *Calepina iregularis* (Asso.) Thell., *Capsella bursa-pastoris* (L.) Medik., *Carduus acanthoides* L., *Carex colchica* Gay ssp. *colchica*, *Centaurea arenaria* Bieb. ssp. *borystenica* (Gruner) Dostal, *Centaurea diffusa* Lam., *Cerastium semidecandrum* L., ***Chamaesycae peplis*** (L.) Prokh. [V], *Chenopodium album* L., *Chondrilla juncea* L., *Cicorium intybus* L., *Conyza canadensis* (L.) Cronq., *Convolvulus arvensis* L., ***Corispermum nitidum*** Kit. in Schultes [V], *Coronilla varia* L., ***Crambe maritima*** L. [V], *Crepis foetida* L. ssp. *rheoadifolia* (Bieb.) Celak., *Crypsis aculeata* (L.) Aiton, *Cynanchum acutum* L., *Cynodon dactylon* (L.) Pers., *Daucus carota* ssp. *carota* L., ***Daucus guttatus*** Sibth. et Sm. **ssp. *zahariadi*** Heywood [R], *Descurainia sophia* (L.) Webb ex Prantl, ***Dianthus bessarabicus*** (Kleopov) Klokov [V], *Diplotaxis muralis* (L.) DC., *Diplotaxis tenuifolia* (L.) DC., *Elaeagnus angustifolia* L., *Elymus elongatus* (Host) Runemark, ***Elymus farctus*** (Viv.) Runemark ex Melderis **ssp. *bessarabicus*** (Săvul. Et Rayss) Melderis [E], *Elymus repens* (L.) Gould, *Erophyla verna* (L.) Chevall., ***Eryngium maritimum*** L. [E], *Eryssimum diffusum* Ehrh., *Erodium cicutarium* (L.) L'Hérit., *Erodium ciconium* (L.) L'Hérit., ***Chamaesycae peplis*** L. [V], *Euphorbia helioscopia* L., *Euphorbia sequieriana* Necker, *Fumaria vaillanti* Loisel., *Gallium humifusum* Bieb., ***Glaucium flavum*** Crantz [V], ***Gypsophyla perfoliata*** L. [R], *Heliotropium europaeum* L., *Holosteum umbellatum* L., *Hordeum geniculatum* All., *Hordeum murinum* L., *Lactuca tatarica* (L.) C.A. Meyer, *Lamium amplexicaule* L., *Lamium purpureum* L., *Lappula squarrosa* (Retz.) Dumort., *Lathyrus tuberosus* L., *Lepidium perfoliatum* L., *Linaria genistifolia* (L.) Miller, *Lotus corniculatus* L., ***Leymus racemosus*** (Lam.) Tzvelev. **ssp. *sabulosus*** (Bieb.) Tzvelev. [V], *Lycopsis arvensis* L. ssp. *orientalis* (L.) Kuntze, *Malva sylvestris* L., *Marrubium peregrinum* L., *Matricaria recutita* L., *Melilotus albus* Medik., *Medicago falcata* L., *Medicago lupulina* L., *Medicago minima* L., *Medicago sativa* L., *Nonea pulla* DC. in Lam. et DC. ssp. *atra* (Griseb) Ciocârlan, *Onopordum tauricum* Willd., *Ornithogalum refractum* Kit., *Papaver rhoeas* L., *Picris hieracioides* L., *Plantago lanceolata* L., *Plantago media* L., *Plantago major* L., *Plantago maritima* L., *Plantago scabra* Moench, *Poa annua* L., *Poa pratensis* L., *Polygonum arenarium* Waldst. et Kit., *Polygonum aviculare* L., ***Polygonum maritimum*** L. [E], ***Polygonum mesembrium*** Chrték [V], *Portulaca oleracea* L., *Reseda lutea* L., *Rubus caesius* L., *Rumex crispus* L., *Salsola kali* L. ssp. *ruthenica* (Iljin) Soó, ***Scolymus hispanicus*** L. [R], *Scorzonera hispanica* L., *Sclerochloa dura* (L.) Beauv., ***Secale sylvestre*** Host. [V], *Senecio jacobaea* L., *Senecio vernalis* Waldst. et Kit., ***Silene borystenica*** (Gruner) Walters [E], *Silene conica* L., ***Silene exaltata*** Friv. [R], ***Silene thymifolia*** Sibth. et Sm. [E], *Sisymbrium orientale* L., *Solanum nigrum* L., *Sonchus arvensis* L., *Stachys atherocalyx* C. Koch, *Stellaria media* (L.) Vill., ***Syrenia montana*** (Pallas) Klokov [V], *Tamarix ramosissima* Ledeb., *Taraxacum officinale* Weber ex Wiggers, *Thlaspi perfoliatum* L., *Torilis arvensis* (Hudson) Link, ***Tragopogon floccosus*** Waldst. et Kit. [V], *Tragopogon pratensis* L. ssp. *orientalis* (L.) Celak, *Tragus racemosus* (L.) All., *Tribulus terrestris* L., *Trifolium fragiferum* L., *Trifolium repens* L., *Valerianella locusta* (L.) Laterrade, *Veronica polita* Fries, *Xanthium italicum* Moretti, *Xanthium spinosum* L., *Xeranthemum annuum* L.

The setting up a new Natural Reserve between North and South Eforie is also supported by the presence of large local population of some rare and threatened psamophilous taxa (*Cakile maritima* ssp. *euxina*, *Elymus farctus* ssp. *bessarabicus*, *Silene thymifolia*, *Eryngium maritimum*, *Glaucium flavum*, *Gypsophyla perfoliata*, *Polygonum maritimum*). Among these plants, *Cakile maritima* ssp. *euxina* and *Elymus farctus* ssp. *bessarabicus* are critical taxa, included in the List of Subendemics and Endangered species from Romania (Aiv) [17]. These plant species have only a sporadic distribution in the rest of the southern Romanian Black Sea coast and they are threatened with extinction by the anthropogenic factors.

In the study area there are also some dune habitat types of European interest for conservation, which are included in the Habitats Directive and Bern Convention [17]. Such habitat types are the embryonic mobile dunes (code 2110) and the seacoast fixed dunes with herbaceous vegetation (priority habitat-code 2130). Among the new habitat types included in Habitats Directive we mention from the researched area the Euxinic coastal salty sand communities with *Cakile maritima* ssp. *euxina*, *Crambe maritima*, *Argusia sibirica*, *Lactuca tatarica*, *Glaucium flavum*, *Euphorbia pepelis* and *Scolymus hispanicus* (code B1, code EUNIS level 2). All these habitat types are endangered by building and other commercial activities within dune habitats.

Human activities adjacent to dune habitats have favoured the development of some weed and ruderal plant associations. As conservation measures are absent, the number of anthropophytic plants will increase, modifying the structure and floristic composition of psamphilous plant communities.

In the investigated area, the following plant associations have been identified: *Atripliceto hastatae-Cakiletum euxinae* Sanda, Popescu 1999 (Syn. *Cakiletum friscum* Tx. 50), *Lactuco tataricae-Glaucietum flavae* Dihoru et Negrean 1976, *Salsolo ruthaenicae-Xanthietum strumarii* Oberd. et Tx. 1950, *Atriplicetum hastatae* Poli et J. Tx.1960, *Agropyretum juncei* (Br. Bl. et De L. 1936) Tx. 1952, *Elymetum gigantei* Morariu 1957, *Secali sylvestris-Brometum tectorum* Hargitai 1940, *Aperetum maritimae* Popescu et al. 1978, *Bromo-Cynodontetum* I. Pop 1970, *Tribulo-Tragetum racemosi* Soó et Timar 1954, *Descurainetum sophiae* Krech 1933 corr. Oberd. 1970, *Hordeetum murini* Libbert 1932 em. Pass. 1964, *Balloto-Malvetum sylvestris* Gutte 1966, *Lepidietum drabae* Timar 1950.

Conclusions

The main reasons in favour of setting up a new Natural Reserve between North and South Eforie are as follows:

The percentage of Rare, Endangered and Vulnerable species (18.29%) is higher than that observed within Agigea dunes Reservation (11.79%) or the seashore area between 2 Mai-Vama Veche villages (10.21%), two protected areas not very far from Eforie.

In the area studied, large populations of many rare and threatened psammophilous species occur, some of sporadic distribution in the rest of the southern Romanian seashore area.

The beginning of some building works, even in the dune biotopes, threatens with extinction the specific flora and plant communities between North and South Eforie.

The presence in the study area of some dune habitat types of European interest for conservation (concordant with Habitats Directive and Bern Convention) sustain our arguments concerning the importance of this area for the conservation of psamphilous flora.

In our opinion, the conservation of the rare psammophilous flora and typical dune biotops is not possible without setting up this area as Natural Reserve, preferably as part of the Natura 2000 protected areas network.

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