Montenegro national report of invasive alien species

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Abstract

The review deals with some aspects of invasive alien species (IAS) in Montenegro on a national and international level (institutional and legal framework related to IAS, main environmental laws that also include IAS, main international conventions and agreements, research institutions related to IAS and IAS research initiatives in Montenegro). A list of the invasive alien species of some groups of the flora and fauna of Montenegro is given in the paper (Rodophyta, Chlorophyta, Angiospermae, Mollusca, Crustacea, Insecta).

Keywords:

Invasive alien species, Montenegro, report

Review of available information on invasive alien species (IAS) in Montenegro

The bibliography of invasive alien species in Montenegro is not abundant. While, for example, invasive alien species in the countries of Central Europe were systematically recorded, in Montenegro they were only sporadic and, in many cases, only accidental records concerning invasive taxa exist.

The most complete data on the flora of Montenegro are given in Hayek's ''Prodromus Florae Peninsulae Balcanicae" (1924-1933) and in Rohlena's ''Conspectus Florae Montenegrinae" (1942), where there are some records of IAS. In the recent times, there are many papers dealing with invasive alien plant species: Černjavski *et al.* (1949) – not given in References, Blečić *et al.* (1968), Popović and Sterniša (1971), Stanković-Tomić (1972), Pulević (1973, 1976, 1984, 2005), Obradović and Budak (1979), Ivković (1982), Ilijanić and Topić (1986), Vasić (1986) – different in References, Trinajstić (1993) Niketić (1998), Lakušić D. and Lakušić B. (1998), Hadžiablahović *et al.* (2003), Hadžiablahović (2004, 2009), Lakušić *et al.* (2004), Stešević and Jovanović (2005a, b), Stešević and Jogan (2006), Rakaj & and Rostansky (2008), Stešević (2009), Stešević and Petrović (2010), Hadžiablahović *et al.* (2011), etc.

Data on invasive alien species of insects are published in the papers: Novak (1952), Mijušković (1953) Protić (1998), Petrov (2000), Roganović (2007a), Roganović (2007b), etc. The established data, at least for some of the insect groups, present the beginning of the investigation in the area of invasive alien species. In the future we expect a much larger number of invasive alien species of insects in Montenegro.

The alien species which exist in the territory of Montenegro are from different taxonomic groups. A list with more than 100 alien species is displayed in Appendix 1.

Review of IAS research activities in Montenegro

Two research projects regarding marine invasive species were implemented in Montenegro.

The report "Rapid assessment of marine alien species in the Albanian and Montenegrin coast" was part of the implementation of the "Action Plan concerning Alien Species and Species Introductions in the Mediterranean Sea", where the RAC/SPA was collaborating with the Hellenic Centre for Marine Research, Greece (HCMR), the Association for the Protection of Aquatic Wildlife of Albania (APAWA) and the Institute of Marine Biology, Kotor, Montenegro (IBMK). This study was based on a survey along the Albanian coast (Ionian Sea and Adriatic Sea) and Montenegrin coast (Adriatic Sea) during September – October 2010, analysing the collected data and the existing published and unpublished information about marine alien species in Albania and Montenegro.

The project "Researching of distribution of *Caulerpa racemosa* in coastal sea of Montenegro" was a 1-year project in 2005. The first phase of this project focused on research of the known location of *Caulerpa racemosa* habitats, being realized in October and November 2005. The second phase was based on research of different locations in the coastal sea of Montenegro. This phase began at the end of May 2006.

The following institutions have been involved in IAS research in Montenegro:

Faculty of Natural Sciences and Mathematics, Podgorica

Institute for Marine Biology, Kotor

Environmental Protection Agency of Montenegro, Podgorica

Natural History Museum of Montenegro, Podgorica

National Parks of Montenegro, Podgorica.

Review of policies related to IAS in Montenegro

The main environmental laws in Montenegro, which have implications for IAS, are the following:

Law of Nature Protection ("Official Gazette of MNE", No. 51/08);

Law on hunting ("Official Gazette of MNE", No. 47/99);

Law on the marine fishery and marine culture ("Official Gazette of MNE", No. 56/09);

Law on National parks ("Official Gazette of MNE", No. 56/09);

Law on reproductive material of wood trees ("Official Gazette of MNE", No. 37/2007);

Regulation on the detailed content of the annual monitoring program of the conservation of nature and the conditions that must be met by the legal entity that monitors ("Official Gazette of MNE", No. 35/10).

In the implementation of the Law of Nature Protection, the Ministry of spatial planning and environment adopted in 2010 the Regulation on the detailed content of the annual monitoring program of the conservation of nature and the conditions that must be met by the legal entity that monitors. Under this regulation the Biodiversity Monitoring program must contain methods for monitoring of invasive alien species. Therefore, when preparing the Monitoring Program for 2011, 2012 and 2013, the Environmental Protection Agency adhered to the requirements of the aforementioned Regulation. Furthermore, according to the Strategy of Biodiversity 2010, the Ministry of sustainable development and tourism in cooperation with the Ministry of agriculture and rural development should prepare an inventory of invasive species, priority plant species.

Montenegro has also ratified the following international conventions and agreements related to IAS:

ESPOO Convention "On Environmental Impact Assessment in a Transboundary Context";

Bern Convention "Convention of the Protection of Flora and Wildlife Fauna of the Natural Environment in Europe";

Bonn Convention "Convention of the Protection of Migratory Species of Wildlife";

United Nations Convention on the Law of the Sea;

CITES "Convention on International Trade of Endangered Species of Wild Fauna and Flora";

ACCOBAMS "Agreement of the Conservation of Cetaceans of the Black See, Mediterranean Sea and Contiguous Atlantic Zone";

Barcelona Protocol concerning Specially Protected Areas and Biological Diversity in the Mediterranean.

The institutions responsible for the implementation of the environmental legislation related also to IAS are:

Ministry of Sustainable Development and Tourism of Montenegro;

Environmental Protection Agency of Montenegro;

Ministry of Agriculture and Rural Development of Montenegro;

National Parks of Montenegro.

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Zakon o morskom ribarstvu i marikulturi, br. 56/09 (Law on the marine fishery and marine culture, "Official Gazette of MNE", No. 56/09).
Zakon o Nacionalnim parkovima, Sl. list CG, br. 56/09 (Law on National parks, "Official Gazette of MNE", No. 56/09).
Zakon o reproduktivnom materijalu šumskog drveća, Sl. list CG, br. 37/2007 (Law on reproductive material of wood trees ("Official Gazette of MNE", No. 37/2007).

Annex 1.

A list of invasive alien species from different taxonomic groups reported in Montenegro.

Rodophyta:
Asparagopsis taxiformis
Wormersleyella setacea

Chlorophyta:
Caulerpa racemosa var. *cylindracea*

Angiospermae:
Acer negundo
Agave americana
Ailanthus altissima
Amaranthus hybridus
Amaranthus retroflexus
Ambrosia artemisiifolia
Amorpha fruticosa
Artemisia annua
Artemisia verlotiorum
Asclepias syriaca
Aster squamatus
Bidens frondosa
Bidens subalternans
Broussonetia papyrifera
Carpobrotus edulis
Chamomilla suaveolens
Conyza canadensis
Cuscuta campestris
Datura stramonium
Echinocystis lobata
Eleusine indica
Eleusine tristachya
Erigeron annuus
Erigeron bonariensis
Erigeron sumatrensis
Euphorbia maculata
Euphorbia prostrata
Galinsoga parviflora
Helianthus tuberosus
Impatiens parviflora
Ligustrum japonicum
Oenothera biennis
Oenothera glazioviana
Opuntia vulgaris
Paspalum dilatatum
Paspalum paspaloides
Phyla nodiflora
= Lippia nodiflora
Phytolacca americana
Reynoutria japonica
Robinia pseudacacia
Solanum elaeagnifolium
Sorghum halepense
Sporobolus poirettii
Sporobolus vaginiiflorus
Sycios angulatus
Veronica persica
Xanthium orientale subsp. *italicum*
Xanthium spinosum

Mollusca:
Bursatella leachii
Crassotera gigas
Melibe viridis
Arion lusitanicus

Crustacea:
Calinectes sapidus

Insecta:
Coccus hesperidum
Corythucha ciliata
Coccus pseudomagnoliarum
Icerya purchasi
Japananus hyalinus
Leptinotarsa decemlieata
Megastigmus wachtli
Metcalfa pruinosa
Planococcus citri
Pulvinaria flocitera
Saissetia oleae
Acizzia uncatoides
Aedes albopictus
Alphitobius diaperinus
Anagyrus pseudococci
Carpophilus bifenestratus
Ceratitis capitata
Chysomphalus dictospermi
Chymomyza amoena
Eucarsia barlesei
Glischrochilus quadrisignatus
Grapholita molesta
Hyphantria cunea
Lyctocoris campestris
Lyphia tetraphylla
Megastigmus spermatrophus
Monomorium pharaonis
Neoclytus acuminatus
Nosopsyllus fasciatus
Pheidole megacephala
Philonthus rectongulus
Phodia interpunctella
Podisus maculiventris
Pristophora laricis
Pseudaonidia paeonidae
Pulvinaria horii
Sceliphron deforme
Sticocephala bisonia
Toxoptera aurantii
Urophorus humeralis
Zygograma saturalis

Pisces:
Fistularia commersonii
Sphoeroides pachygaster

Mammalia:
Herpestes ichneumon