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Цей збірник наукових доповідей присвячень основним підсумкам виконання Стратегічного плану дій по реабілітації і охороні Чорного моря (1996-2000 рр.), підсумкового документа першого етапу виконання Міжнародної Чорноморської Екологічної Програми ООН. У цьому зв'язку надруковані матеріали відображають основні розділи Програми, а саме: швидке реагування при надзвичайних ситуаціях, моніторинг забруднення і стандарти якості навколишнього середовища, захист біологічної різноманітності, розробка загальної методології управління прибережною зоною моря, рибальство, освіта і громадська поінформованість в природоохоронній області. В статтях представлені результати раніше не надруковані результати наукових досліджень. Подані дані, їх інтерпретація і закінчення належать авторам повідомлень і ні в коєму разі не можуть бути приписані членам організаційного комітету, які склали даний збірник.
Збірник призначень для широкого кола спеціалістів у галузі біології і екології моря, океанографії, техногенної безпеки і охорони природи.

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Present issue is devoted to the main results of Strategic Action Plan for the Rehabilitation and Protection (SAPRP) of the Black Sea (1996-2000) implementation. The SAPRP is a resulting document of the Black Sea Environmental Program (GEF/UN/UNDP) first step. The published materials have been reflected by the main Program sections: emergency response, pollution monitoring and environmental quality standards, protection of biodiversity, integrated coastal zone management, fisheries, environmental education and public awareness. These papers are the results of scientific research haven't been unpublished earlier. The findings, interpretations and conclusions expressed in papers, are in own property of the authors and should not battributed in any manner to the members of organization committee, which prepared this issue.
The issue was design for specialists in the field of marine biology and ecology, oceanology, technogenic safety and environmental protection.

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CHRONICLE OF EXOTIC SPECIES INTRODUCTION INTO THE BLACK SEA

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According to the Strategic Action Plan for the Rehabilitation and Protection of the Black Sea (see s. 41) the "Black Sea states will present a joint proposal to the ΓMO (International Maritime Organization), in 1997, for conducting an in-depth study on measures to avoid any further introductions of exotic species into the Black Sea through the deballasting of vessels" [20].

A special GEF/IMO/UNDP Project "Removal of Barriers to the Effective Implementation of Ballast Water Control and Management Measures in Developing Countries" was launched in 1999. In order to ensure effective actions in this direction a Scientific Workshop on Ballast Water Management and Control was held in the Black Sea on board of the research vessel "Georgij Ushakov" from 14 to 17 September 1999. The Workshop was attended by 40 participants from the Black Sea, Sea of Azov and Caspian Sea riparian countries and IMO. This meeting was a first step to support the GEF/IMO/UNDP Project.

The Odessa Branch, Institute of Biology of the Southern Seas National Academy of Science of Ukraine carried out long-term researches of different aspects of man-made impact on the Black Sea ecosystem, including such a specific form of pollution like the introduction of nonnative species [25].

A summary table of accidentally and/or intentionally introduced exotic species in the Black Sea, the Sea of Azov and adjoining water bodies is represent bellow.

More than 30 species of alien aquatic plants and animals were registered in the Black Sea basin during XX century. There are three periods of accidentally introduction of the new species into the Black Sea, which have been directly connected with human activity.

The firs one (1920-1950) is the period of intensive shipping development (appearance of high-speed diesel engine vessels and building of the new harbors). There were 8 exotic organisms, which are mostly fouling species and have penetrated into the Black Sea on the hulls.

The second period (1951-1980) have been characterized by diminishing of the accidentally introduction of exotic species. This fact it is possible to explain by the wide application of the antifouling coating. For example, in 70-s overwhelming majority of the ships processed by tributyltin (TBT) which protected the hulls from fouling during 18-24 months. So 11 from 12 exotic organisms during the second period were intentionally introduced species (fishes and shrimps). It is interesting to note, that increasing salinity of the Sea of Azov as a result of infill of Tsemliansk reservoir in 1952 and regulated run-off of Don and Kuban rivers cause the penetration of some new species from the Black Sea.

During the third period (1981-2000) have been revealed of disequilibrium of marine ecosystem because of large-scale eutrophication started from 1973 [26]. So high intensity of alien species appearance (about one species per year) was connected with changes of productivity benthic and pelagic communities of the Black Sea. Owing to this situation, it may be confirmed that with the changing conditions of the ecosystem that have taken place during a rise in trophic status during eutrophication, there has been a disturbance in the stability and the ecological niches formed by the invading highly productive species, which are more adapted to new conditions [1]. Principal mediator of alien species penetration during this period was ballast water. The main part of exotic species have been registered during this period were pelagic organisms during their ontogenesis. Another confirmation of causal relationship of the alien species and the vessels were their discovering in immediate proximity to harbors. It is necessary to stress that uncontrolled delivery of exotic organisms promotes to appearance the new competitors to native flora and fauna species and stimulates still more destabilization effect. According rough estimate of IMO, about 10 billions ton of the ballast water which contained not less than 3000 species transported yearly in World Ocean [21].

The authors are entertaining a hope that the data of this summary table compiled from published materials, unpublished author's surveys and personal communications can serve for following investigations in one of the most critical and urgent marine environmental problems.

Accidental and intentional introduction of exotic species into the Black Sea

№	Taxa	Species	Year	Place of the first registration	Habitat	Author
1	BIVALVIA	*Teredo navalis*	750-500 B.C.	Black Sea, Sea of Azov (1953)	Submerged wood	5
2	CIRRIPEDIA	*Balanus improvisus*	1844	Black Sea, Sea of Azov	Fouling	5
3	CIRRIPEDIA	*Balanus eburneus*	1892	Sevastopol Bay	Fouling	13
4	BIVALVIA	*Crassostrea gigas**	1900s	Crimean and Caucasian coast	Fouling	26
5	BACILLARIOPHYTA	*Rizosolenia calcar-avis*	1924	The Sea of Azov	Pelagic zone	16
6	PISCES	*Gambusia affinis holbrooki**	1925	Kolkheti lowlands	Pelagic zone	26
7	HYDROZOA	*Blackfordia virginica*	1925	River's mouths near Burgas	Fouling	22
8	POLYCHAETA	*Mercierella enigmatica*	1929	Paleostomi Lake, Sea of Azov (1956)	Fouling	2,8
9	PISCES	*Lepomis gibbosus*	1930s	Danube delta	Pelagic zone	26
10	HYDROZOA	*Bougainvillia megas* (syn. *Perigonimus megas)*	1933	Varna Lake, Sea of Azov (1959)	Fouling	8, 14
11	DECAPODA	*Rithropanopaeus harrisii tridentatus*	1937	Dneprovsko-Bugsky liman	Benthic zone Fouling	9
12	GASTROPODA	*Rapana thomasiana thomasiana* (syn. *R. venosa)*	1946	Novorossiysk Bay	Benthic zone Fouling	6
13	ENTOPROCTA	*Urnatella gracilis*	1950	Danube and Dniester river mouth area	Fouling	27
14	PISCES	*Hypophthalmichthys molytrix**	1950s	Dneprovsko-Bugsky liman, Odessa Gulf	Pelagic zone	26
№	Taxa	Species	Year	Place of the first registration	Habitat	Author
15	GASTROPODA	*Potamopyrgus jenhnsii*	1952	Razelm-Sinoe lagoon	Benthic zone	5
16	DECAPODA	***Pandallus kessleri**** (syn. ***P. latiroslris)***	1959	Khadzhibey and Kyzyltash limans	Bentho-Pelagic zone	17, 26
17	PISCES	*Plecoglossus altivellis**	1963	Black Sea	Pelagic zone	26

18	PISCES	***Race us saxatitis****	1965	Dneprovsky liman, north-western Black Sea, Caucasian coast	Pelagic zone	26
19	PISCES	***Salmo gairdneri****	1965	Shabolatsky liman	Pelagic zone	26
20	BIVALVIA	*Mya arenaria*	1966	Odessa Gulf	Benthic zone Fouling	3
21	DECAPODA	*Callinectes sapidus*	1967	Bulgarian shelf	Benthic zone	4
22	PISCES	*Mugil soiuy**	1968	Black and Azov Seas, limans, lagoons, deltas	Pelagic zone	19
23	PISCES	*Oryzias latipes **	1970s	Kuban river, Sea of Azov	Pelagic zone	23, 26
24	DECAPODA	***Penaeus japonicus****	1970s	Razelm-Sinoe and other Black Sea lagoons	Bentho-Pelagic zone	26
25	PISCES	***Onchorhynchus keta****	1972	Caucasian rivers	Pelagic zone	26
26	PISCES	***Dicentrarchus labrax****	1977	Black Sea	Pelagic zone	26
27	PISCES	***Lateolabrax japonicus****	1978	Black Sea	Pelagic zone	26
28	NUDIBRANCHIA	*Doridella obscura*	1980	Varna Bay	Fouling	18
29	PRASYNOPHYCEA	*Mantoniella squamata*	1980s	Inshore Romanian area of the sea	Pelagic zone	10
30	BIVALVIA	*Scapharca inaequivalvis*	1982	Caucasian shelf	Benthic zone	24
31	CTENOPHORA	*Mnemiopsis leidyi*	1982	Sudak Bay (Crimean coast)	Pelagic zone	15
32	DINOPHYTA	*Scrippsiella trochoidea*	1989	Bulgarian coast	Pelagic zone	12
33	CHRYSOPHYTA	*Phaeocystis pouchettii*	1990	Bulgarian coast	Pelagic zone	12
№	Taxa	Species	Year	Place of the first registration	Habitat	Author
34	DINOPHYTA	*Gesnerium mochiamensis*	1991	Bulgarian coast	Pelagic zone	12
35	PHAEOPHYTA	*Desmarestia viridis*	1992	Odessa Gulf	Fouling	11
36	CTENOPHORA	*Beroe cucumis*	1997	Odessa Gulf, Bulgarian coast (Shabla)	Pelagic zone	7,25
37	DECAPODA	*Eriocheir sinensis*	1998	Yuzhny harbor and Cape Bolshoy Fontan in the north-western Black Sea	Benthic zone	25

""intentional introduction (unsuccessful attempts are print in bold type)

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