
The book represents proceedings of Second International Symposium “Invasion of Alien Species in Holarctic. Borok - 3” (5 Oct. – 9 Oct. 2010, Borok - Myshkin, Yaroslavl District, Russia). The articles are divided into the four main divisions: General Problems, Plants, Invertebrates, Vertebrates. The wide spectrum of problems related to appearance and spread of invasive plants and animals is discussed. The book may be interested for specialists expertise in many fields, such as limnologists, hydrobiologists, ecologists, botanists, zoologists, geographers, managers of dealing with nature preservation and fisheries.

Editors:
Yury Slynko, Yury Dgebuadze, Alexandr Krylov, Dmitriy Karabanov.

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Lable of Sympozium:
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ISBN
The III International Symposium
INVASION OF ALIEN SPECIES IN HOLARTIC
(BOROK – 3)

October 4-5, 2010
Arrival of Symposium's participants.

CONFERENCE AGENDA

Day 1: October 5, 2010
Myshkin Cultural Center

09:30 – 10:30 Registration
10:30 – 11:00 Welcome speeches:
Dr. Alexandr I. Kopylov – director of Papanin Institute of Biology of Inland Waters Russian Academy of Science, Russia
Corresponding member of RAS Yury Yu. Dgebuadze – deputy director of Severtsov Institute of Ecology and Evolution Russian Academy of Science, Russia
Dr. Zhibin Zhang - Institute of Zoology, Chinese Academy of Sciences, China.
Fomproix N. - executive director of International Union of Biological Sciences, France

Keynote lectures
Facilitator: Shiganova T.A., Dr.

11:00 – 11:20 BIOLOGICAL INVASION OF ALIEN SPECIES AS GLOBAL ECOLOGICAL CHALLENGE. Dgebuadze Yu.Yu. Severtsov Institute of Ecology and Evolution, RAS

11:20 – 11:40 THE NATURE OF THE MOST SUCCESSFUL AND LARGE-SCALE INVASION OF THE PONTO-CASPIAN SPECIES IN HOLARCTIC FRESHWATER ECOSYSTEMS. THE HYPOTHESES OF FRESHWATER SPRINGBOARDS. Slynko Yu.V., Yakovlev V.N. Papanin Institute for Biology of Inland Waters RAS, Borok, Russia

11:40 – 12:00 BIOTIC INVASIONS AND PROBLEM OF SPECIES AEAS’ BIOGEOGRAFIC BORDERS OF NORTHERN EURASIA. Tishkov A.A., Belonovskaya E.A. Institute of geography RAS, Moscow, Russia

12:00 -12:40 Coffee break, Group Photo in front of Myshkin Cultural Center building
12:40 – 13:00
TREND ON INCREASING THERMOPILE NON-NATIVE SPECIES IN THE BLACK SEA LINKED TO CLIMATE CHANGE. Shiganova T.A. Shirshov Institute of Oceanology RAS, Moscow, Russia.

13:00 – 13:20
MEASURING SPECIES’ ECOLOGICAL NICHE OVERLAP IN SPACE AND TIME. Broennimann O.1, Fitzpatrick M.C.2, Pearman P.3, Petitpierre B.1, Kueffer C.4, Guisan A.1 - 1Dept. of Ecology and Evolution, University of Lausanne, Switzerland; 2Appalachian Lab, Frostburg, USA; 3Swiss Federal Research Inst. WSL, Birmensdorf, Switzerland; 4Institute of Integrative Biology, ETH Zurich.

13:20 – 13:40
BIOTIC INVASIONS OF INSECTS AND GEOGRAPHY OF FITOSANITARY SITUATIONS IN RUSSIA. Maslyakov V.Yu., Izhevsky S.S. Institute of Geography RAS; Moscow State University of Forest, Moscow, Russia.

13:40 – 14:00
SPATIAL AND TEMPORAL FISH SPECIES ASSOCIATIONS IN THE AREA INVADED BY SIX INVASIVE FISHES. Kočšo J.1, Pekárik L.2, Košuthová L.3, Košuth P.3 - 1Faculty of Human and Natural Sciences, University of Prešov, Prešov, Slovakia; 2Institute of Zoology, Slovak Academy of Sciences, Bratislava, Slovakia; 3Department of Parasitology, University of Veterinary Medicine, Košice, Slovakia

14:00 – 15:20
Lunch – banquet hall of hotel “Sammit”

Keynote lectures
Facilitator: Yury Yu. Dgebuadze, Dr.

15:20 – 15:40
ALIEN MAMMAL SPECIES IN BIOSPHERE RESERVES OF RUSSIA. Bobrov V.V. Severtsov Institute of Ecology and Evolution RAS, Russia

16:40 – 17:00
DYNAMICS OF CHANGES IN SPECIES COMPOSITION OF INVASIVE PLANTS IN AMURSKAY OBLAST (154th PERIOD). Aistova E.V. Botanical garden Amur Scientific Center Far Eastern Branch RAS, Russia

17:00 – 17:20
ALIEN SPECIES IN THE RUSSIAN FAR EAST SEAS. Zvyagintsev A.Yu., Radashevsky V.I., Ivin V.V., Kashin I.A., Gorodkov A.N. Institute of Marine Biology FEB RAS

17:20 – 17:40
NONLETHAL APPROACHES TO CONTROL ALIEN RODENTS. Voznessenskaya V.V., Malanina T.V. Severtsov Institute of Ecology Evolution RAS, Russia

17:40 – 18:20
Discussion

19:00
Welcome Dinner in Myshkin Cultural Center
Day 2: October 6, 2010
Myshkin Cultural Center

Session 1. Information systems for the monitoring of invasions. Mathematical modelling of species invasions.
Facilitator: Vladimir G. Tereshenko, Dr.

9:00 – 9:20

9:20 – 9:35
TESTING THE HYPOTHESIS ABOUT HISTORY OF INTRODUCTIONS OF THE FISH PERCCOTTUS GLENIUS USING PARASITOLOGICAL APPROACH. Reshetnikov A.N., Sokolov S.G., Protasova E.N. Severtsov Ecology and Evolution Institute RAS, Russia.

9:35 – 9:50
MECHANISMS OF GLOBAL WARMING EFFECTS ON INVASION SUCCESS OF SMALL AND LARGE CLADOCERAN SPECIES. Feniova I.Yu. Severtsov Institute of Ecology and Evolution RAS, Moscow, Russia.

9:50 – 10:05
TO THE PROBLEM OF REGIONAL «BLACK-BOOKS» CREATION. Notov A.A.¹, Vinogradova Yu.K.², Majorov S.R.³ - ¹Tver State University, Russia; ²Tsitsin Main Botanical Garden RAS, Russia; ³Lomonosov Moscow State University, Russia.

10:05 – 10:20
ASSESSING THE RISKS OF AQUATIC INVERTEBRATES INVASIONS IN THE SHATT AL-ARAB REGION. Naser M.D.¹, Son M.O.² – ¹Marine Science Center, Basrah University, Iraq; ²Odessa Branch Institute of Biology of the Southern Seas, Ukraine.

10:20 – 10:45
Coffee break

Session 1. Information systems for the monitoring of invasions. Mathematical modelling of species invasions. (Continues).
Facilitator: Varos G. Petrosyan, Dr.

10:45 – 11:00

11:00 – 11:15
DIFFERENCES BETWEEN SOLIDAGO CANADENSIS, S.GIGANTEA AND S. GRAMINIFOLIA IN TERMS OF ANATOMIC CHARACTERS OF THEIR LEAVE BLADES. Vinogradova Yu.K.¹, Brindza J.² – ¹Tsitsin Main Botanical Garden RAS, Russia; ²Slovak University of Agriculture in Nitra, Faculty of Agrobiology and Food Resources, Slovakia.
11:15 – 11:30
MORPHO-ECOLOGICAL FEATURES OF ALIEN GYDOBIONTS IN THE DNIEPER RESERVOIRS. Novitsky R. A. Dnepropetrovsk National University, Dnepropetrovsk, Ukraine.

11:30 – 11:45
ON THE POSSIBILITY OF DETERMINING THE DEGREE OF DELAYING THE INVASIVE DANGER OF ADVENTIVE SPECIES OF PLANTS. Khoroon L.V. Tula State Lev Tolstoy Pedagogical University, Tula, Russia.

11:45 – 12:30
Discussion

13:00 – 14:30
Lunch – banquet hall of hotel “Sammit”

Session 2. The role of global geoclimatic and anthropogenic processes in biological invasions.
Facilitator: Arkady A. Tishkov, Dr.

14:30 – 14:45
THE PHENOMENA OF THE BIOTA EXTINCTION IN THE GEOLOGICAL PAST AND NOWDAYS. Tuganaev V.V., Veselkova N.R. The Udmurt State University, Russia.

14:45 – 15:00
INVASIONS OF ALIEN PLANKTIC ALGAE IN HOLARCTIC FRESHWATERS. L.G. Korneva. Institute for biology of Inland Waters RAS, Russia.

15:00 – 15:15
PREDICTIONS OF THE FUTURE RANGE EXPANSION OF THE FISH PERCCOTTUS GLENII USING BIOCLIMATIC MODELS. Reshetnikov A.N.¹, Ficetola G.F.² – ¹Severtsov Ecology and Evolution Institute RAS, Russia; ²University of Milano-Bicocca, Italy

15:15 – 15:30
WILL THE RISK OF PLANT INVASIONS INTO THE EUROPEAN ALPS INCREASE WITH CLIMATE CHANGE? Blaise Petitpierre¹, Christoph Kueffer², Tim Seipel², Antoine Guisan¹ – ¹Dept. of Ecology and Evolution, University of Lausanne, Switzerland; ²Institute of Integrative Biology, ETH Zurich, Switzerland.

15:30 – 15:45
ROLE OF THE CLIMATIC FACTORS IN THE TRANSFORMATION OF MODERN PLANKTONIC PHYTOCENOSIS STRUCTURE (THE NORTH-EASTERN BLACK SEA, AS AN EXAMPLE). Pautova L.A.¹, Silkin V.A.², Prokopov O.I.², Lukasheva T.A.², M.N. Meerov² – ¹Shirshov Institute of Oceanology RAS, Russia; ²Southern branch of Shirshov Institute of Oceanology RAS, Russia.

15:45 – 16:15
Coffee break
**Session 2.** The role of global geoclimatic and anthropogenic processes in biological invasions. (Continues).
Facilitator: Ludmila G. Korneva, Dr.

16:15 – 16:30
**PHYTOPLANKTON IN SHIPS’ BALLAST WATER IN THE PORT OF VLADIVOSTOK.** Morozova T.V., Selina M.S., Stonik I.V., Shevchenko O.G., Zvyagintsev A.Yu. Zhirmunsky Institute of Marine Biology FEB RAS, Vladivostok, Russia

16:30 – 16:45
**LINES OF OIL-TRUNK PIPELINES AS NEW MIGRATION WAYS.** Martynenko A.B., Omelko M.M., Ostapenko K.A. Far eastern Federal University, Vladivostok, Russia

16:45 – 17:00
**ON ROLE SHIPS’BALLAST WATERS IN DISTRIBUTION OF PLANKTON SPECIES IN THE NORTHEASTERN BLACK SEA.** Selifonova Zh.P. Murmansk marine biological Institute Kola science center RAS, Russia

17:00 – 17:15
**ZOOPLANKTON OF SHIPS’ BALLAST WATER IN THE PORT OF VLADIVOSTOK: ALIEN COPEPOD SPECIES AND THEIR INFLUENCE IN COASTAL COMMUNITIES.** Kas’yan V.V. Zhirmunsky Institute of Marine Biology FEB RAS, Russia

17:15 – 18:00
Discussion

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**Day 3: October 7, 2010**
Myshkin Cultural Center

**Session 3.** Influence of alien species on indigenous species and communities.
Facilitator: Alexandr V. Krylov, Dr.

9:00 – 9:15
**INVASIVE AMPHIPODS AS TRANSFORMATION FACTOR OF LAKE LADOGA ECOSYSTEM.** Kurashov E.A., Barbashova M.A., Rusanov A.G. Institute of Limnology RAS, Russia

9:15 - 9:30
**SEASONAL AND LONG-TERM CHANGES OF BENTHIC INVASIVE SPECIES ABUNDANCE IN UPPER REACHES OF KUYBYSHEV WATER RESERVOIR**
Yakovlev V.A., Yakovleva A.V. Kazan Federal University, Kazan, Russia.

9:30 - 9:45
**EFFECT OF KEYSTONE SPECIES ON DIFFERENT FRESHWATER ECOSYSTEMS IN THE NORTH–WEST OF RUSSIA.** Shcherbina G.Kh. Institute for biology of Inland Waters RAS, Russia

9:45 – 10:00
**DISTRIBUTION OF INVASIVE SPECIES IN THE BOTTOM CENOSES OF THE LITTORAL ZONE OF THE SARATOV RESERVOIR.** Kurina E. M. and Zinchenko T. D. Institute of Ecology of the Volga Basin RAS, Tolyatti, Russia
10:00 – 10:15
ABOUT INVASIVE ZEBRA MUSSEL’S IMPACT (DREISSENA POLYMORPHA) TO NATIVE BIVALVES POPULATIONS. Sylayeva A.A., Protasov A.A., Morozovskaya I.A. Institute of Hydrobiology of NAS, Kiev, Ukraine

10:15 – 10:30
ESTIMATION OF INFLUENCE THE NON-INDIGENOUS CLADOCERAN EVADNE ANONYX G.O. SARS, 1897 ON NATIVE SPECIES IN SOUTH-EASTERN PART OF THE BALTIC SEA. Semenova A.S. Atlantic Research Institute of Marine Fisheries and Oceanography, Kaliningrad, Russia

10:30 – 10:45
ROLE OF BAIKAL AMPHIPOD IN THE FEEDING OF ONEGA LAKE FISH. Ilmast N.V., Kuchko Ya.A. Institute of Biology KRC RAS, Petrozavodsk, Russia

10:45 – 11:00
FACTORS OF ADVENTIVE SPECIES SPREADING IN SMALL RIVERS OF THE LOWER DNIEPER (UKRAINE). V.N. Kochet. Research Institute of Biology, Dnipropetrovsk National University, Dnipropetrovsk, Ukraine.

11:00 – 11:30
Coffee break

Session 3. Influence of alien species on indigenous species and communities.
(Continues)
Facilitator: Irina Yu. Feniova, Ph.D.

11:30 – 11:45

11:45 – 12:00
ALIEN FLORA OF PROTECTED AREAS (VORONEZH BIOSPHERE RESERVE AS AN EXAMPLE). Starodubtseva E.A. Voronezh Biosphere Reserve, Voronezh, Russia

12:00 – 12:15
INFLUENCE PARASITES ON THE PROCESS OF NATURALIZATION ALIEN MAMMALS SPECIES. Romashov B.V. Voronezh Biosphere Reserve, Voronezh, Russia

12:15 – 12:30
PARASITE FAUNA OF ALIEN AQUATIC SPECIES IN THE VOLGA RIVER BASIN. Tyutin A.V., Medyantseva E.N., Kiyashko V.I., Izvekova G.I. Institute for Biology of Inland Waters RAS, Borok, Russia

12:30 – 12:45
RELATIONS BETWEEN THE RED KING CRAB (PARALITHODES CAMTSCHATICUS) AND SOME NATIVE MACRO-INVERTEBRATES IN THE BARENTS SEA. Rzhavsky A.V., Britayev T.A. Severtsov Institute of Ecology and Evolution RAS, Russia
12:45 – 13:00
ALIEN MALACOSTRACAN CRUSTACEANS IN THE EASTERN BALTIC SEA. Berezina N.A., Petryashev V.V. Zoological Institute RAS, St.Petersburg, Russia

13:00 – 13:15
ROLE INVASION TYPES IN FEEDING OF RAVENOUS FISH OF KUIBUSHEV RESERVOIR. Shakirova F.M., Severov Yu.A. The Federal Agency on fishing, Tatar department of FSSI «GosNIORH», Kazan, Russia

13:15 – 13:30
FEED OF THE COREGONUS PELED AND COREGONUS AUTUMNALIS MIGRATORIUS FROM KRASNOKAMENSKOYE RESERVOIR AND THEIR INFLUENCE ON THE FORAGE RESERVE. Gorlacheva E.P. Institute of Natural Resources of Ecology and Cryology SB RAS, Russia.

13:30 – 13:45
WHAT IS THE IMPACT OF TWO INVASIVE SPECIES, BLACK BULLHAED (AMEIURUS MELAS) AND AMUR SLEEPER (PERCCOTTUS GLENII) ON LOCAL FISH FAUNA? Pekárik L.¹, Koščo J.², Košuthová L.³, Košuth P.³ – ¹Institute of Zoology, Slovak Academy of Sciences, Bratislava, Slovakia; ²Faculty of Human and Natural Sciences, University of Prešov, Prešov, Slovakia; ³Department of Parasitology, University of Veterinary Medicine, Košice, Slovakia

13:45 – 14:00
DISTRIBUTION OF SILVER CRUCIAN CARP (CARASSIUS AURATUS GIBELIO) IN THE COASTAL ECOSYSTEMS OF THE EASTERN PART OF THE SEA OF AZOV. Abramenko M.I. South scientific centre RAS, Rostov-na-Donu, Russia

14:00 – 15:00
Lunch – banquet hall of hotel “Sammit”

Session 4. Genetics and evolution of biological invasions.
Facilitator: Yury V. Slynko, Ph.D.

15:00 -15:15
GENE FREQUENCIES DYNAMICS IN KILKA POPULATIONS UNDER THE INFLUENCE OF NATURAL SELECTION FACTORS. Tereshchenko V.G., Slynko Yu.V. Papanin Institute for Biology of Inland Waters Russian RAS, Borok, Russia

15:15 – 15:30
DETECTION OF THE MITOCHONDRIAL DNA HAPLOTYPE CHARACTERISTIC OF THE PELED (COREGONUS PELED) IN THE VENDACE (C. ALBULA) POPULATIONS OF RYBINSK RESERVOIR IN VOLGA UPPERS. Borovikova E.A. Papanin Institute for Biology of the Inland Water RAS, Borok, Russia

15:30 -15:45
MOLECULAR DIAGNOSTIC SYSTEMS TO DISCRIMINATE DREISSENA POLYMORPHA (ZEBRA MUSSEL) AND DREISSENA BUGENSIS (QUAGGA MUSSEL). Voroshilova I.S. Papanin Institute for Biology of Inland Waters RAS, Borok, Russia
15:45 – 16:00
MAINTENANCE AND RAPID RESTORATION OF GENETIC DIVERSITY IN AN EXPERIMENTAL MODEL OF THE FOUNDER EFFECT IN THE RAINBOW TROUT. Artamonova V.A.¹, Terentyeva E.G.², Rysakova K.S.³, Golod V.M.², Makhrov A.A.¹, Boguerouk A.K.², Lyzhov I.I.³ – ¹Severtsov Institute of Ecology and Evolution, Russia; ²Federal Centre for Fish Genetics and Selection, Russia; ³Knipovich Polar research institute of marine fisheries and oceanography, Russia

16:00 – 16:15
GENETIC CONSEQUENCES OF INTERSPECIFIC HYBRIDIZATION FOR INDIGENOUS SPECIES. Slynko Y.V., Stolbunova V.V., Kodukhova J.V. Papanin Institute for Biology of Inland Waters, RAS, Borok, Russia

16:15 – 16:30
PECULIARITIES OF THE POPULATION STRUCTURE OF ALIEN SPECIES OF FISHES IN KUYBYSHEV WATER RESERVOIR. Semenov D.Yu. Ulyanovsk State University, Ulyanovsk, Russia

16:30 – 17:00
Coffee break

Session 4. Genetics and evolution of biological invasions. (Continues)
Facilitator: Alexandr A. Makhrov, Ph.D.

17:00 – 17:15
THE ROLE OF INVASIONS IN EVOLUTION OF COMMENSAL TAXA OF MUS MUSCULUS SENSU LATO SPECIES GROUP. Kotenkova E.V. Severtsov Institute of Ecology and Evolution RAS, Moscow, Russia

17:15 – 17:30
INFLUENCE OF INVASION BIDENS FRONDOSA L. ON NATIVE BUR-MARIGOLDS. Vasileva N.V., Papchenkov V.G. Institute for biology of Inland Waters RAS, Russia

17:30 – 17:45
RESPONSE OF THE ATLANTIC SALMON SALMO SALAR POPULATION OF THE KERET' RIVER ON THE INVASION OF PARASITE GYRODACTYLUS SALARIS. Makhrov A.A.¹, Shulman B.S.², Artamonova V.A.¹, Khaimina O.V.³, Yurtseva A.O.⁴, Lajus D.L.⁴, Shirokov V.A.⁵, Shurov I.L.⁵ – ¹Severtsov Institute of Ecology and Evolution, Russia; ²Zoological Institute RAS, Russia; ³Russian State Hydrometeorological University, Russia; ⁴St. Petersburg State University, Russia; ⁵Northern Fisheries Research Institute, Russia

17:45 – 18:00
PHYLOGENETIC INTERRELATIONSHIPS OF THREE INTRODUCED POPULATIONS OF GMELINIOIDES FASCIATUS (STEBBING, 1899) (CRUSTACEA: AMPHIPODA) INFERRED FROM MOLECULAR DATA. Malavin S.A.¹, Petunina Zh.V.², Sherbakov D.Yu.¹ – ¹Zoological Institute RAS, Russia; ²Limnological Institute SB RAS, Russia

18:00 – 18:15
ADAPTIVE VARIATIONS OF TOTAL BIOCHEMICAL AND LIPIDS COMPOSITION IN FINGERLINGS OF NON-INDIGENOUS AND NATIVE FISH SPECIES UNDER SHORT-TERM FLUCTUATIONS OF ENVIRONMENTAL FACTORS IN RYBINSK RESERVOIR. Khalko V.V. Papanin Institute for Biology of Inland Waters RAS, Borok, Russia
18:15 – 18:30
TEMPERATURE ADAPTATIONS OF SPECIES-INVADERS AND NATIVE SPECIES OF FISHES. THE COMPARATIVE ANALYSIS. Golovanov V. K. Institute for Biology of Inland Water RAS, Russia

18:30 – 18:45
EFFECTS OF NATURAL AND ANTHROPOGENIC FACTORS UPON CARBOHYDRASE ACTIVITIES IN ALIEN SPECIES. Golovanova I.L. Institute for Biology of Inland Water RAS, Russia

18:45 – 19:30
Discussion

Day 4: October 8, 2010
Myshkin Cultural Center

Session 5. Dynamics of biological invasions in Holartic in space and time.
Facilitator: Eugeniy A. Kurashov, Dr.

9:00 – 9:15
INVASIVE POTENTIAL OF ADVENTITIOUS PLANTS AT THE MIDDLE URAL. Tretyakova A.S. Ural State University, Russia

9:15 – 9:30
DYNAMICS OF POPULATIONS BIDENS FRONDOSA L. AND ITS HYBRIDS ON VOLGA RESERVOIRS. Papchenkov V.G. Institute for biology of Inland Waters RAS, Russia

9:30 – 9:45
THE SPECIES OF CRASSULACEAE AS SUBJECTS OF ADVEN TIVE FLORA. Byalt V.V. Herbarium of Higher Plants (LE) of Komarov Botanical Institute RAS, Russia

9:45 – 10:00
PECULIARITIES OF DISTRIBUTION INVASIVE PLANT SPECIES ON THE UPPER VOLGA BASIN TERRITORY. Borisova E.A. Ivanovo State University, Ivanovo, Russia

10:00 – 10:15
ADVENTIZATION OF FLORA ON THE NORTH-WESTERN CAUCASUS. Belonovskaya E.A. Institute of geography RAS, Moscow, Russia

10:15 – 10:30
THE NEW SPECIES OF PHYTOPLANKTON IN THE NORTH - EASTERN PART OF THE BLACK SEA. Yasakova O.N. Southern Scientific Centre RAS, Rostov on Don, Russia

10:30 – 10:45

10:45 – 11:00
THE INVASION TRENDS OF CHANGES OF ZOOPLANKTON COMMUNITIES IN LOW VOLGA RIVER RESERVOIRS. Malinina J.A. State Research Institute on Lake and River Fisheries Saratov Department, Saratov, Russia

11:00 – 11:30
Coffee break
 Session 5. Dynamics of biological invasions in Holartic in space and time.
(Continues)
Facilitator: Vladimir G. Papchenkov, Dr.

11:30 – 11:45
MACROINVERTEBRATES INVASION IN AQUATIC ECOSYSTEMS OF THE UPPER OB BASIN. Yanygina L.V., Vinarski M.V. The Institute for Water and Environmental Problems SB RAS; Omsk State Pedagogical University, Omsk, Russia

11:45 – 12:00
OF THE IMPORTANCE OF INVASIVE SPECIES OF ZOOBENTHOS IN THE ECOLOGICAL SYSTEM OF THE VOLGOGRAD RESERVOIR. Filinova E.I. State Research Institute on Lake and River Fisheries, Saratov Department, Saratov, Russia

12:00 – 12:15
DYNAMIC OF RED KING CRAB REPRODUCTION IN THE BARENTS SEA COASTAL WATERS IN 2001-2010. Pereladov M.V. Russian Federal Research Institute of Fisheries and Oceanography (VNIRO), Russia

12:15 – 12:30
THE TRANSFORMATION OF ICHTHYOFARNA IN WESTERN SIBERIA DURING LAST CENTURY. Yadrenkina E.N. Institute of Systematics and Ecology of Animals, Siberian Branch of Russian Academy of Sciences, Novosibirsk, Russia.

12:30 – 12:45
DYNAMIC DISTRIBUTION TENDENCIES OF SOME FISH SPECIES IN MONGOLIA. Erdenebat M.1, Slynko Yu.V.2 – 1Institute of Geoecology MAS, Ulaanbaatar, Mongolia; 2Papanin Institute for Biology of Inland Waters RAS, Borok, Russia

12:45 – 13:00
THE STATE OF THE INVASIVE SPECIES, SYAMOZERO SMELT, OVER 40 YEARS. Sterligova O.P. Institute of Biology KRC RAS, Petrozavodsk, Russia

13:00 – 13:15
INTRODUCTION OF VENDACE (Coregonus albula) IN PASVIK RIVER ECOSYSTEM. Reshetnikov Yu.S.1, Popova O.A.1, Amundsen Per-Arne2 – 1Severtsov Institute of Ecology and Evolution RAS, Russia; 2Department of Arctic and Marine Biology, University of Tromso, Norway

13:15 – 13:30
MODERN DIVERSITY OF ALIEN FISHES IN THE TCHU AND TALAS RIVER WATERSHEDS. Mamilov N.Sh. Institute for biology and biotechnology problems in Kazakh National University, Kazakhstan

13:30 – 13:45
ALIEN FISHES THE SOUTH OF THE WESTERN-SIBERIAN PLAIN INSTALLED IN RESERVOIRS IN XX BEGINNING OF XXI CENTURIES. Korlyakov K.A. Chelyabinsk state university, Russia
13:45 – 14:00
CURRENT CHANGES IN FISH POPULATION OF THE EUROPEAN RUSSIAN NORTH-EAST LARGE RIVERS. Zakharov A.B.¹, Boznak E.I.² ¹Institute of Biology Komi Scientific Division of UB of RAS, Russia; ²Syktyvkar State University, Russia

14:00 – 14:30
Discussion

14:30 – 15:45
Lunch – banquet hall of hotel “Sammit”

16:30 – 19:00
Poster Session’s Discussion.

19:00 – 22:00
Farewell Party with National Colour (Myshkin Cultural Center)

Day 5: October 9, 2010
ROUND TABLES

9:00 – 11:00
Myshkin Cultural Center, Main hall

Round Table 1. “Methods for the study of biological invasions”
Speakers – specialists of Company “Biogen-Analytica”

Keynote lectures:
1. «Mass spectrometry Sequenom for population researches and cluster analysis of various bunches of organisms»
2. «Genetical identification: DNA allocation, amplification, gel-documenting and sequenation»
3. «Microscopic techniques for a finding of alien species»
4. «Peptide synthesis and assays preparation for analysis of proteins»

9:00 – 11:00
Myshkin Cultural Center, Small hall

Round Table 2. “Social and political aspects of biological invasions. International and regional collaboration in alien species studies”

Keynote lectures:
1. Fomproix N. IUBS, France “IUBS AND BIODIVERSITY PRESERVATION”
3. Panov V.E. St.Petersburg State University, Russia, and Regional Euro-Asian Biological Invasions Centre, Finland “OPEN ACCESS JOURNAL "AQUATIC INVASIONS" - INTERNATIONAL COMMUNICATION FORUM FOR PROFESSIONALS IN AQUATIC INVASIVE SPECIES RESEARCH AND MANAGEMENT”

11:00 – 13:00
Trip to Myshkin town and museums
INVASION OF ALIEN SPECIES IN HOLARTIC. BOROK – 3

13:00 – 14:00
Lunch – banquet hall of hotel “Sammit”

14:00 – 18:00
Travel on Volga river by ship
or Trip to Myshkin town and museums (continues)

18:00 - 19:00
Buss Departure trip to Moscow and Yaroslavl (train station) (For The Moscow directions)

24:00
Buss Departure trip to Shestikhino train station (For The St.-Petersburg, Samara, Ufa and Other similar directions)

Poster session
Myshkin Cultural Center


1. SOME DATA ON A FEEDING OF STARRY GOBY BENTHOPHILUS STELLATUS SAUVAGE, 1874 IN THE CHEBOKSARY RESERVOIR. Frolova E.A., Bayanov N.G. Nizhniy Novgorod laboratory of State Scientific-Research Institute Lake and River Fisheries, Nizhniy Novgorod, Russia.


3. THE NEW RECORDS OF POTAMOPYRGUS ANTIPODARUM (GRAY, 1843) IN FRESH WATER BODIES OF KALININGRAD REGION (RUSSIA). Filippenko D.P. The Kaliningrad State Technical University, Kaliningrad, Russia.

4. PECULIARITIES OF DISTRIBUTION OF DIKEROGAMMARUS CASPIUS (PALLAS) IN THE VOLGOGRAD RESERVOIR. Filinova Ye.I., Sonina Ye.E. SO FGNU GosNIORH, Saratov, Russia.

5. ABOUT THE INTRINSIC GROWTH RATE OF KILKA CLUPEONELLA CULTRIVENTRIS (NORDMANN, 1840) POPULATIONS IN THE RESERVOIRS CONDITIONS. Tereshchenko V.G., L.I.Tereshchenko. Papanin Institute for Biology of Inland Waters RAS, Borok, Russia.

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DISTRIBUTION OF SILVER CRUCIAN CARP (*CARASSIUS AURATUS GIBELIO*) IN THE COASTAL ECOSYSTEMS OF THE EASTERN PART OF THE SEA OF AZOV

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Until the mid of the XX century *Carassius auratus gibelio* wasn’t numerous natural component of the Sea of Azov basin’s ichthyocenoses and its population by absolutely dominant gynogenetic form was presented (Abramenko, 2001).

According to the opinions of many authors the main cause of ecological and bioresources changes in the basin of the Sea of Azov has been the building of the Tsimlyansk Reservoir (1952) and the Krasnodar Reservoir (1975) that led to radical transformation of hydrologic and hydrochemical regimes of the water system (Bessonov et al., 1991; Volovik et al., 1992, 1996; Makarov, Semyonov, 1996). Sudden increase of silver crucian carp number in the Don Delta and Foredelta (those are the main areas of pollutants sedimentation of the river runoff) coincides in time with the critical decrease of stocks and the lack of spawning of the valuable anadromous and semianadromous fish in the beginning of the 1980s (Makarov et al., 1988).

As a result of transformation of a genetic structure with domination of the bisexual form and appearing of own male’s number in the population of the silver crucian carp the dependence that regulated reproduction of the earlier dominated gynogenetic form by the direct connection between the number and the spawning terms of males of relative carp species such as *Cyprinus carpio*, *Carassius carassius*, *Abramis brama* has been disappeared (Abramenko et al., 1997).

In the period of 1980-1991 in the basin of the Sea of Azov the boost of silver crucian carp’s number and extension of its habitat due to desalination of coastal aquatories of the Taganrog Bay has been observed. Nowadays *Carassius auratus gibelio* permanently nearly on the whole Russian shelf zones of the Sea of Azov and the Ukrainian coastal part of the Taganrog Bay is found. Since 1987 this subspecies has been detected in the central sea areas. Individuals of the Sea of Azov stocks of the silver crucian carp need fresh water only during reproduction stage. They enter rivers or spawn in estuary, coastal lakes, or coastal parts of the Sea of Azov (pic. 1). Summer-autumn fattening migrations of this subspecies over the all aquatory of the Taganrog Bay and the Temryk Bay are observed. Because of multiportion spawning and high nonspecific resistance to gas regime and pollutants (Abramenko et al., 1998) the silver crucian carp nowadays dynamically settles shallowing and silting waters of estuary and coastal lakes spawning areas of the Taganrog Bay as well as all coastal part of the Eastern part of the Sea of Azov. Under the circumstances of intensive overcatch of hydrobionts this subspecies gradually occupies new biotopes that are vacant of native representatives of ichtyophauna (Abramenko et al., 2009).
Species *Sinodiaptomus sarsi* (Rylov, 1923) is widely widespread in Mongolia (Боруцкий, 1959), China (Shen, Song, 1979; Lu et al., 2002; Zhao, Dong, 2004), it is met in Iran (Smagowicz, 1976), Turkey (Gündüz, 1998), Azerbaijan (Боруцкий, etc., 1991). Close to *S. sarsi* version *S. vakanovi* (Kiefer, 1938) is registered in the USA, Bulgaria (Боруцкий, etc., 1991), Japan (Tomikawa, 1971; Ueda, Ohtsuka, 1998) and New Zealand (Duggan et al., 2006). Within the limits of Russia it is noted in Dagestan, Krasnodar area (Боруцкий, etc., 1991), in the Far East it is found in Amur river (Боруцкий, etc., 1991; Боруцкий, 1958).

In territory of Eastern Siberia *S. sarsi* it is found for the first time in June, 1997 in steppe reservoir-cooler of the Charanorskoje state district power station (N 50°28.563 ', E 116°20.682), located in Onon river basin. Female body length (excluding furcal setae) 1.82-2.10 mm, male - 1.65-1.90 mm. The species meets in June-July in deep-water places (3.8-5.7 m). Number and a biomass values of imago changed accordingly from 5 up to 240 ind m⁻³ and from 2.13 up to 102.46 mg m⁻³ for all investigation period (1997-2007) with a maximum of values in the first year, during intensive “flowering” blue-green weed. Invasion thermophilic species in reservoir, possibly, has occurred through Onon river where migrated from the Amur river.
DYNAMICS OF CHANGES IN SPECIES COMPOSITION OF INVASIVE PLANTS IN AMURSKAY OBLAST (154TH PERIOD)

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The global scale of the anthropogenic influence on the species has reflected in the decrease in their number and general changes of species composition of native flora and fauna. Unique natural complexes are replaced by anthropogenic violated territories which become a kind of a reservoir for many invasive species.

Vicinity with the other regions and foreign countries let invasive plants reach the territory of Amurskaya oblast and the existence of anthropogenic habitats promotes the spread and naturalization of these plants. The periods of 1855-1933 and 1950-2009 were the most productive for the research into invasive flora. Up to 1855 no researches have been devoted to invasive plants. From 1855 to 1933 there were found 56 invasive species 8 of which finally became extinct. Since 1950 the composition of invasive species has been supplemented with 83 additional specimens, 12 of which were gathered just once. The weeds which were not listed in the region after 1990 are Agrostemma githago L., Camelina microcarpa Andrz., Hyosyamus niger L., Rhinanthus vernalis (N. Zing.) Schischk. Et. Serg., Sonchus brachyotos DC., S. oleraceus L. their potential extinction is linked with their belonging to a certain cultivation or accidental introductions. In 2003 we discovered Oxyparpis oxyphylla (Pall.) DC., Euphorbia waldsteinii (Sojak) Czer., Elymus fibrosus (Schrenk) Tzvel., Sorghum saccharatum (L.) Moench, which were introduced accidentally. Some of them were discovered in 1960s-1970s.

The detailed analysis of invasive flora and “refugees” in Amurskaya oblast, peculiarities of their spread, naturalization, biology, mapping, and search for protobe insects help forecast and restrain the spread of invasive plants.
MAINTENANCE AND RAPID RESTORATION OF GENETIC DIVERSITY IN AN EXPERIMENTAL MODEL OF THE FOUNDER EFFECT IN THE RAINBOW TROUT


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Many populations of alien species are characterized by a relatively high genetic diversity (Roman, Darling, 2007). To determine the cause of this phenomenon, the genetic diversity was estimated in an experimental population of the rainbow trout strain Rosteel obtained by inbreeding (brother \& sister crosses) during five consecutive generations of the offspring of one pair of founders.

The strain was compared with a heterogeneous stock of steelhead trout (the anadromous form of rainbow trout) from which the founders of the strain originated. Six microsatellite loci were analyzed in 25 females and 25 males from each stock.

It was found that, although the genetic diversity of the Rosteel strain was decreased compared to steelhead trout, the decrease was smaller than it could be expected. More than four alleles, some of them not found in steelhead trout, were identified for some loci.

It is assumed that intense selection for viability, fertility, and growth rate in the course of creating the strain favoured the maintenance of genetic diversity. The appearance of new alleles is likely to have resulted from enhanced recombination due to inbreeding (Zhuchenko, Korol, 1985).

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ABOUT DYNAMICS OBLITERATION LAKES KOTOKELSKOE (PRIBAIKALYE) 
ELODEA CANADENSIS MICH.

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The lake Kotokelskoe (the area 68,9 - 70 km2, average depth of 4-4,5 m, maximal 14) is located in 3 km from Baikal and has a drain in it through the rivers Kotochek - the Turk. In June, 2008 among population Kotokel flash Gaffskoi illnesses (syndrome АТPM - alimentary paraksimalnai toxic mioglobinaria) in a combination to long destruction of fishes (from May, 2008 till July, 2009) is registered. Flash ATIM was preceded with long depression of a forage reserve of fishes and decrease fish productivity lakes with 418 τ (1989) up to 19,5 τ (2000-2005) (Matveev, etc., 2008). Distrovicasthia lakes rapid development of invasive species Elodea canadensis and its dying off (Bazova, etc., 2009) referred to as one of the reasons. In this connection the analysis of development Elodea canadensis in lake is lead.

First registration Elodea canadensis in lake Kotokelskoe in 1986 (a northwest corner, in a shelf of sewage of sanatorium «Baikal pine forest ») (Kyzmich, 1988) is dated. In 1988 it is registered on shoaliness of the western coast up to a southern part, in 1991 from northeast (Mostovai) up to southeast (Cheremyshci). Maximal biomass Elodea reaches in 1992 (942.1 τ/m2 ACB). In 1993 essential reduction of the area obliteration Elodea up to 5,5 % of water area has begun. Next years Elodea canadensis has probably dropped out of structure biota lakes - 2003 (Bobcov, 2004), 2007 (Basova, the oral message). In 2009 at hydrobotanical shooting single spots Elodea canadensis are found out in a mouth of a stream Bridge (the western coast, a bay the Roadway).

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ADVENTIZATION OF FLORA ON THE NORTH-WESTERN CAUCASUS.

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For the purpose of revealing of the peculiarities of the north-western Caucasian flora comparing of adventive flora, detected in the region in the first half and the second half of the 20th century was done.

In the beginning of the 21 century 275 invasive species (IS) were indicated (Zernov, 2006). That twice as large as in the first half of the 20th century (125 IS) (Grossheim, 1949). It is 10,5 % of the whole regional flora and it is a lit bit more in compare with the adventization degree of the Greater Caucasus in general (6,4 %).

As usual Poaceae and Asteraceae stand out of the amount of IS (15,2 % and 13,5 % of the whole regional adventive flora consequently). Practically new IS appeared in every family. Besides, the diversity of adventive flora increased: nearly 40 new IS species of the 21 new families appeared there. Among them exotic species appeared: among Palmae and Cactaceae (by 2 species) and Agavaceae (1 species).

Concerning amount of species the aggressive species from America are in lead there (40 % of the regional adventive flora) and the majority of them is the native from North America (30 %). The amount of Mediterranean species is increased up to 32 species and the group became rather big (14,5 %).

The most of mentioned IS are the feral species cultivated in orchards, parks and gardens of adjacent plain and seashore zone which is under development nowadays.

Low (rarely middle) altitudinal belt is a limit for distribution of the IS. High degree of species and ecosystem diversity and entirely composed natural and seminatural communities are the main reason protecting IS’ penetration to the mountain and highmountain belts. That’s why prevention of every vegetation destructions and fragmentation is very important.
ALIEN MALACOSTRACAN CRUSTACEANS IN THE EASTERN BALTIC SEA

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The Baltic Sea is a unique brackish ecosystem of Eurasia which due to osmotic stress for both marine and freshwater origin species is characterized by low species diversity and as other mesohaline seas is easily colonized by alien species. The recent increase in abundance of alien malacostracan crustaceans poses an additional risk of both structural and functional changes in the ecosystems, influencing on different components of native communities. This paper focuses on the invasion history of malacostracan crustaceans in the coastal habitats of the Gulf of Finland (easternmost part of the Baltic Sea), describes the biological traits that make this taxonomic group a successful invader and attempts to characterize effects on invertebrate communities (mainly through trophic interactions) in recipient ecosystems after successful establishment. Six amphipod species (Chaetogammarus warpachowskyi, Chelicorophium curvispinum, Pontogammarus robustoides, Gmelinoides fasciatus, Gammarus tigrinus, and Orchestia cavimana), two mysids (Hemimysis anomala and Paramysis intermedia), the isopod Jaera sarsi and two decapods (Eriocheir sinensis and Palaemon elegans) have been recorded as alien species in the Gulf of Finland by 2010. Analysis of literature data and our results indicate that these alien species became important components of the food web in invaded areas. Their significance in food webs depends strongly on ontogenetic stage of invader changing during its life cycle and type and availability of food in the invaded habitats. They have efficiently outnumbered or even completely replaced native species and/or earlier established invaders. The potential impact of alien Malacostraca on the native community in the Gulf of Finland was derived mainly after predation was evaluated.
ALIEN MAMMAL SPECIES IN BIOSPHERE RESERVES OF RUSSIA

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The present study is devoted to assessing the alien mammals in Biosphere Reserves (BR) of Russia. The largest numbers of alien species were observed in the Tsentralno-Chernozemny, Prioksko-Terrasny and Voronezhsky BR (15, 12 and 11 species, respectively). The smallest number (only one) of alien species was observed in Barguzinsky, Kedrovaya Pad and Taimyrsky BR. The percentage of alien species compared to the total fauna of mammals observed in Tsentralno-Chernozemny and Astrakhansky BR is 32.6% and 26.9%, respectively. Many mammal species were intentionally introduced into reserves, including the present-day BR, during the Soviet time, including Neovison vison and Nyctereutes procyonoides. Several species were intentionally introduced and settled down in biosphere reserves to enrich their fauna, for example, Sciurus vulgaris, Castor canadensis, and Capreolus pygargus. Mammals that were introduced close to protected areas often penetrated the biosphere reserves (for example, Lepus europaeus, Sciurus vulgaris, Marmota bobak, Castor fiber, Martes foina, Sus scrofa, Cervus nippon). A lot of work has been done to reintroduce some species into biosphere reserves, such as Ovibos moschatus, Bison bonasus, and Castor fiber. Synanthropic rodents were accidentally introduced into many biosphere reserves as a result of humans. The mammal fauna in biosphere reserves is often extended by self-spreading.

The study was conducted with the financial support of the Fundamental Research Programme “Biological Resources of Russia” (Project No. II.4.12), and the RBRF (Project No. 08-04-01224a). The author would like to thank the directors and experts from all BR of Russia who submitted information about alien mammal species in their areas.
PECULIARITIES OF DISTRIBUTION INVASIVE PLANT SPECIES ON THE UPPER VOLGA BASIN TERRITORY

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The Upper Volga basin is one of the well industrially developed and urbanized districts of European Russia. It is included Ivanovo, Kosrtoma, Yaroslavl, Vladimir and Tver’ administrative regions (the area – 203.5 thousand km²). The present flora of these district comprises 770 alien species, among them 135 successfully naturalized in natural and semi-natural communities and 32 (4.2%) are invasive plants. Only 24 invasive species (3.1%) are widespread in the all Upper Volga regions. It is coordinated (conformed, corresponded) with hypothetic model of invasive intensity (Di Castri, 1990). The majority (e.g. Bidens frondosa, Calystegia inflata, Elodea canadensis, Epilobium adenocaulon, Juncus tenuis, Impatiens glandulifera) is have invaded in water bodies and riparian communities. Some species (e.g. Acer negundo, Amelancier spicata, Fraxinus pennsylvanica Sambucus racemosa) are commonly recorded the different types of forest and shrub ecosystems; another (e.g. Arrhenatherum elatius, Aster lanceolatus, Festuca arundinacea, Lolium perenne, Lupinus polyphyllus, Phalaris arundinacea septentrionale) – in grassland. Echinocystis lobata, Heracleum sosnowskyi, Hippophae rhamnoides, Impatiens parviflora are most aggressive and play transformer role. The example of local invasive are Galega orientalis, Symphytum uplandicum in Ivanovo region, Zizania latifolia in Kostroma region, Valinsneria spiralis in Yaroslavl region, Linaria canadensis in Vladimir region.

26 alien species belong to potential invasive group. They successfully compete with native species and have trend for invasions in plant communities (e.g. Crataegus monogyna, Populus balsamifera, Parthenocissus inserta, Reynoutria japonica).
DETECTION OF THE MITOCHONDRIAL DNA HAPLOTYPE CHARACTERISTIC OF THE PELED (*COREGONUS PELED*) IN THE VENDACE (*C. ALBULA*) POPULATIONS OF RYBINSK RESERVOIR IN VOLGA UPPERS

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The Rybinsk reservoir is the water body that has been used for the active fisheries management. Thus, during several decades of the XX century numerous introductions of vendace (*Coregonus albula*) and peled (*C. peled*) from different locations in the reservoir were carried out (Yakovlev et al., 2001). At present, several populations of the vendace exist in the reservoir, but peled has not been detected by morphological features in the catches.

At the same time, PCR-RFLP analysis of the mitochondrial DNA (mtDNA) *ND*-1 fragment of Rybinsk reservoir *C. albula* revealed complex haplotype characteristic of the peled. It appears that at present the vendace’s populations of the reservoir have the mixed origin and will consist most likely not only of descendants of the vendace occurring from different water bodies, but also peled. On the other hand, detection of the peled haplotype allows assuming also hybridization between two species. In this case, the pure species state of the Rybinsk reservoir vendace populations is questionable.
The genetic features of eight morphologically and geographically divergent populations of the tubenose goby (*Proterorhinus marmoratus*) from Volga and Don Uppers were studied by analysis of the mitochondrial DNA (mtDNA) and microsatellites. For comparison the genetic variation of several populations from native area were researched. Polymorphism was screened at microsatellites loci and sequence 365-bp fragment of the mtDNA cytochrome b gene, which is polymorphic in Gobiidae. Moreover, we quantified the morphological variability of tubenose gobies using meristic and morphometric characters.

Sequencing revealed a total of five haplotypes, twelve nucleotide positions (3.3%) were polymorphic. The intraspecific diversity within the tubenose goby defined three haplotype groups. One group comprised haplotypes, which were distributed in Volga and Don Uppers. Two another groups comprised haplotypes characteristic of the tubenose goby from Dnepr and Mzymta River (Adler, Black Sea basin) respectively. This data allowed supposing common originating of *P. marmoratus* populations in Volga and Don Uppers. At the same time, morphological data did not reveal any differentiations between tubenose goby from different basins and water bodies.
MEASURING SPECIES’ ECOLOGICAL NICHE OVERLAP IN SPACE AND TIME

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Robust tools are required to better anticipate and manage ongoing and future biological invasions. Species Distribution Modeling (SDM) is commonly used to predict potential species distribution but its efficiency may be lowered if change in the realized niche takes place between the native and invaded ranges. We propose a new multivariate analytical framework in a gridded climatic space to quantify niche change in space and time. Our method is robust to known and previously undocumented biases related to the dependence of species occurrences on the frequency of environmental conditions that occur across geographic space. We evaluate within this framework several ordination and species distribution modeling (SDM) methods for quantifying niche overlap and for testing hypotheses regarding niche differences using simulated species distributions. We also test for niche changes in the large scale climatic niche of 50 Holarctical plant species invasive in Eurasia or North America. Of the techniques we considered, PCA-env, a Principal Component Analysis which summarizes the entire range of climatic variability found in the study area provided the best results. Niche similarity between native and invaded ranges was found for 23 species and 5 species tend to move into new environments during the invasion process. Species with narrower native niche experience more important changes in the invaded range. Testing for changes in ecological niches is primary to assessing how successfully SDMs can be transferred from one region or time to another.
THE SPECIES OF CRASSULACEAE AS SUBJECTS OF ADVENTIVE FLORA

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The family Crassulaceae includes about 1700 species distributed almost cosmopolite in conditions of semiarid climate. In Russia many of them are grown in green houses or in the rooms but about 40 spp.– in open ground. are not segetal weeds, but them can easily to escape by the availability of suitable habitats (rocks, ungrassed slopes or sands). That is why they rarely are naturalized on plains with prevalence of closed plant associations. Adventive are known practically in all large regions of the world. In the zone of tropical forests pantropical weeds meets – Bryophyllum pinnatum (L.) L. f. &c., and some species as Kalanchoe laciniata and K. spathulata. In Australia 15 wild species of Tillaea and about 50 adventive species are known (Australian Plant Census, 2010).– Aeonium (2), Bryophyllum (8), Cotyledon orbiculata, Crassula s.l. (13), Kalanche (3), Sedum (8) and Tillaea (3). Many adventive species meets in New Zealand (13 wild species of Tillaea and about 30 naturalized species – Aeonium (5), Bryophyllum (2), Cotyledon orbiculata, Crassula s.l. (3), Greenovia aurea, Hylotelephium spectabile, Kalanchoe grandiflora, Rochea coccinea, Sedum s.l. (9) and Tillaea decumbens. Among them are large number of escaped species from Canarian islands (6), because of the resemblance of natural conditions of these groups of islands (Webb & al., 1988). In South America timed to mountains regions (spp. of Echeveria, Villadia and Sedum), only species of Tillaea meets in plains. Between adventive species – Sedum acre and S. rupestre (Zardini, 1971; Zuloaga, 1999). In tropics of South America – Bryophyllum pinnatum and Kalanche spathulatum. In North America (included Mexico) about 300 species meets. By this in USA and Canada 31 escaped species meets – Aeonium (3), Bryophyllum (5), Cotyledon (2), Hylotelephium (2), Jovibarba (1), Kalanche (3), Phedimus (3), Sedum (9), Sempervivum (1), Tillaea (2). In Africa wild also are numerous (ca. 350 spp.), but adventive species are scanty (Bryophyllum pinnatum, B. fedtschenkoi, B. tubiflorum, Aeonium arboreatum и др.). Eurasia, especially in Europe are notable for large diversity of adventive species. Here Aichryson laxum (Portugal), Aeonium arboreatum (Mediterranean region), Tillaea campestris and Crassula ovata (Spain), Sedum multiceps (Corse and south of France) &c. are naturalized. In Middle and North Europe – species of Sedum s.l. and Sempervivum. In Scandinavia – Hylotelephium anacampseros, H. ewersii, Aizopsis aizoon, A. hybrida, A. kanttschatica, Sedum hispanicum, S. pallidum, S. lydium, Sempervivum arachnoideum, S. tectorum, Phedimus spurius, Ph. stoloniferus &c. (Jalas & al., 1999). In Siberia and Far East, Sedum acre and S. hispanicum are escaped. Some species – in Japan and China (Bryophyllum pinnatum, Sedum acre, S. hispanicum, S. pallidum, etc.). In the East Europe – Phedimus spurius, Ph. crenatus, Ph. stolonifera, Sedum reflexum, S. forsterianum, S. lineare, S. sexangulare, Hylotelephium erythrostictum, Aizopsis hybrida, A. kanttschatica, Sempervivum tectorum и др.). Now S. reflexum actively are escaped (in Crimea, in environs of Mariupol, Belgorod and Volgograd regions, on Caucasus). often are cultivated in cemeatersies (ca. 40 spp. in environs of St-Petersbourg) and where them sometimes are escaped along ditches and in ruderal places (Phedimus spurius, Aizopsis hybrida, Sedum sexangulare). In Volgograd region we collected escaped Jovibarba globifera, Sedum reflexum and S. sexangulare near cemeatersies.

Adventive belongs to neophytes and colonophytes (rare to ephemerophytes). Historically they became more or less in mass to spread outside their main areals only beginning with XV–XVI centuries, but especially in XIX–XX centuries by influence of antropogenetic factor. Limited factor for its wide naturalization in East Europe is the absence of suitable habitats (rocks and stony slopes). The majority of adventive species meets near from places of its cultivation (the first stage of naturalization) – in Botanical gardens, grounds, parks and cemeteries. But some allien are known along railways and along roadsides.
BRIEF REVIEW OF ADVENTIVE SPECIES OF FAMILY CAPRIFOLIACEAE S. L. IN TERRITORY OF SAINT-PETERSBOURG AND LENINGRAD REGION.

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The family Caprifoliaceae s.l. are represented on the territory of North-West of Russia by 4 genera and 6 native species (Tsvelev, 2000). Besides of, in this region large number of introduced species are successfully grown from different places of world. Some of these cultivated in St-Petersbourg and Leningrad region species not only well grows in conditions of culture, but escaped and even are naturalized. The first stage of the naturalization of cultivated species can be considered the appearance of the self planting around plantings in Botanical Gardens and Arboreta. The next stage of the naturalization is the appearance of escaped plants outside of the culture – in the road sides, in ruderal places or around neglected gardens and farmsteads. And last stage is can be named the inculation of introduced plants in nature communities and the formation of new plant groupings. In St. Petersburg and Leningrad region species of Caprifoliaceae are represented in all stages of naturalization.


So Lonicera chamissoi Bunge ex P. Kirillow, L. chrysantha Turcz. ex Ledeb. and Diervilla lonicera Mill. easily give the selfplanting in Dendrarium of St-Petersbourg Forest Academy although in the meanwhile cases of escaping outside Botanical Gardens are don’t fixed. Also single cases of escaping of Lonicera periclymenum L. in island Prigranichnyi in Gulf of Finland (Noskov et al., 2004), L. periclymenum L. on the frontier of Russia and Finland (Glazkova, 2001), and L. tatarica L. (Dendrarium of St-Petersbourg Forest Academy) are revealed.

The selfplanting and young plants of Viburnum lantana L. meets around the plantings in parks (for example, in Arboretum «Otradnoye», in the forest near railway station Elizavetino, etc.). Viburnum lento L. was met by N.N. Tsvelev in edge of forest near the village Lisino-Korpus (Tsvelev, 2000). At that time, Symplicarpos rivularis Suksd. can preserved long time in the place of old culture and even to form large overgrowth sg. by vegetative way, sometimes this species meets in rubbish heaps, but we don’t forced to observe evident selfplanting of this species. Lonicera nigra meets in escaped condition in environ of St-Petersbourg (environ of village Serovo near Zelenogorsk, village Komarovo, Gladyshevskyi protected territory). L. involucrata meets by railways in St. Petersburg, in environ of Zelenogorsk (road sides near Serovo and in damp forest along Black river, etc.). Rare in culture species L. karelinii Bunge ex P. Kirillow are finded as escaped in environ of Komarovo (Doronina, 2008)

Sambucus racemosa L. is in last stage of naturalization. This species penetrated into the flora of region relatively recently (neophyte), but it meets already in diverse habitats and plant associations (as breaked as natural).

In spite of the different origin, all species are well-adapted to nature-climatic conditions of Russian North-West. At present time we began the monitoring of adventive species of Caprifoliaceae s.l. for further revealing of species of this family which are potentially capable of naturalization in this territory.
As a result of civilization development, geographical openings, and trade living organisms exchange does take place between countries and continents of the world. This process called biological invasion of alien species dramatically intensified in the end of the XX century due to significant growth of anthropogenic impact and climate change.

Biological invasion determined as penetration of species to ecosystems situating outside of their native ranges we are analyzing first of all as ecological issue including in this term cases of reintroductions and relict taxons expansion. Thus biological invasion is not only intentional introduction valuable species and accidental introduction with traffic, ballast waters etc., but self-spreading of species because the climate and density changes and other cases including artificial restoration of endangered or extinct species. There are many examples of ecological impact of alien species invasion in the broad sense of the word. Such impact is more formidable when invaders are key stone species, predator, competitor or parasite of aboriginal species.

In global scale biological invasions of alien species cause biota homogenization when as a result both taxonomic (set of species) and ecological (set of ecological guilds, communities and ecosystems) diversity are changing in many regions. In local scale ecosystems transformation and sometimes degradation are observed. The last occurrence connects with ecosystem persistence loss to any influences including natural changes.

Natural biological resources such as forest resources, water resources, pasturable resources, and game resources which exploited by humans in extensive way in such transformed ecosystems sharply decreased. Alien species which have cause and transmit diseases or consume other organisms bring decline of biological production in artificial ecosystems also.

Some of mentioned invasive situation observed in Russia under consideration.
SPECIAL FEATURES AND PERSPECTIVES OF NEW ALIEN SPECIES *NITOCRA SPINIPES* (COPEPODA, HARPACTICOIDA) SETTELMENT IN LADOGA LAKE

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Currently Lake Ladoga experiences an increase in the invasions of non-native species. In this research paper we look into the introduction of a new species of harpacticoida *Nitocra spinipes* Boeck. This work presents the results of a research that we have been conducting in the open water season at various littoral stations from 2003 through 2009. The samples of meiobenthos were taken by MB-TE Core sampler (S=26.4 cm²), fixed by a weak solution of formalin and studied in a laboratory using standard methods.

The first data on the presence of *N. spinipes* in Lake Ladoga were received by us in 2003. The comprehensive survey of the littoral zone of the entire lake in 2006 allowed us to locate the places where the introduction of the non-native species occurred. It spread in the southern and eastern parts of the lake. A seasonal research (from April till October) on two biotopes – in the reeds and in the open sand littoral zone – demonstrated the *N. spinipes*’ preference for the latter. It has never been found in the macrophytes associations. In terms of seasonal distribution all cases of finding the copepods (including females with the egg sacks) happen in the second half of the summer and in the autumn. The density of copepods population has not been high so far – 800 to 6400 copepods per m².

An unusual feature of this invasion is that *N. spinipes* is a brackish-water species. Its presence in the continental freshwater lakes has not been reported before. But it has been known that this species is well adapted to the salinity changes and does not display a behavioural response of avoidance in response to even the very large variations in the salinity concentrations, but withstand them using regulatory and adaptation mechanisms. According to resent researches the sediments composition play more significant role in the distribution of harpacticoids than the water salinity. As our data show, *N. spinipes* in Lake Ladoga prefer sandy environments which are widespread and cover all south coastal shore and in strips the parts of eastern and western shores.

Taking into account that this alien species does not have any special requirements in regard to food (it feeds on detritus, bacteria, algae and even on dissolved organic matter), has a short generation time and is well adapted to sudden changes in environmental conditions, it can be speculated that there is a high probability of the continuation of its settlement in the preferred littoral biotopes and of the further growth of its population.
In 2006 in the river Oka above of Kaluga we find out the white-finned gudgeon *Romanogobio albipinnatus* (Lukasch, 1933) - a new fish species to area (Korolev, etc., 2008). By present time it has extended on river within the Kaluga area, and also on its tributaries of I order - the Ugra, Jizdra and Nare. In 2007 and 2008 two cases of capture in Oka the monkey goby *Neogobius fluviatilis* (Pallas, 1814) are registered (Dyakina, etc., 2009). Earlier distribution of this species to areas was limited to basin of Dnepr. One more new species to area - the round goby - *Neogobius melanostomus* (Pallas, 1814) has appeared in the spring of 2009 in Oka up to Kaluga at once in significant amounts. In 1996 in basin of the upper Oka the Ukrainian lamprey *Eudontomyzon mariae* (Berg, 1931) is found out (Margolin, etc., 2001). In 2007 we had been identified for the first time the Ukrainian lamprey (E. mariae) in tributaries of Oka - the Ugra and Jizdra (Lang et al., 2008).

Except the species introduced in basin of the upper Oka, for last 30 years three more invader species have filled up fish fauna water bodies of the Kaluga area. A spotted silver carp *Aristichthys nobilis* (Richardson, 1846) and a grass carp *Ctenopharyngodon idella* (Val., 1844) have been delivered in area as objects of fish culture. They get to the rivers from fish-breeding economy, but in natural conditions do not breed. The third species Amur sleeper *Perccottus glenii* Dybowskii, 1877 was naturalized in many ponds and in individual quantities meets in the rivers (Korolev, 2007).
ACER NEGUNDO L. IN COASTAL PHYTOCENOSES OF VORONA RIVER

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1868 accounting areas were described for the period of the researches, the extension of the researches, and the extension of the routes is 93.5 km. There are about 30 kinds of trees belonging to 13 families.

The analysis of the received information show that in the accounting areas 9 tree species dominate, it is 30% from general number of registered species. They are: Populus tremula L., Ulmus grabla L., Alnus glutinosa L., Quercus robur L., Acer negundo L., Acer tataricum L., Acer platanoides L., Tilia cordata Mill., Fraxinus excelsior L. It is established on materials of forest regulation, that in 1984 in Derbensky forest area was the seeding of Acer negundo L. in №36 and №26 quarters with the area of 0.8 and 1.0 hectare accordingly; there was a numerous cultivation of this kind in Inzhavinsky forest area: in 1960 on the area of 1.2 hectare; in 1965 – 0.7 hectare; 1985 – 1.0 hectare.

Cameral processing of the received information showed the presence of Acer negundo L. on 45.1 % of the accounting area (figure). Significant submittance of Ulmus grabla L. and Acer tataricum L. is the typical factor of the average stage of successional development, where denrotsenozy of the river Vorona are situated. High factor of the abundance of Alnus glutinosa is predicted because of stripped hocking of the accounting areas along the water's edge.

It is established that the studied kind is notable for maximal domination, it is located on 12.26% of platforms, where the presence of domination of some kind and maximal value of index of Berger-Parker is noted.

This information indicates a pronounced expansion of alien species and its considerable invasive potential.
DYNAMIC DISTRIBUTION TENDENCIES OF SOME FISH SPECIES IN MONGOLIA

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Mongolian water system is based on Khalkh gol, Kherlen gol, Onon, Shishhed, Bulgan gol, Selenge, Tes, Great lake depression, Southern lakes valley watersheds in the country which geographically belong to the three main world catchments region such as Pacific Drainage Basin, Arctic Ocean Drainage and Central Asian Inland Basins.

Now days under nonindigenous fish accepted to call the processes, connected with the appearance and impacts of alien species on communities biological invasion. All cases of living organisms penetration into ecosystem situated over the borders of their original (usually, in nature) natural habitats are seen to be biological invasions.

Biological invasions has been started since 1970 in Mongolia. In Selenga river basin before introduction Amur carp, Amur catfish, and bream and potan in Russian part were inhabited 18 fish species. Last 2 species newly observed since 2004.

But in Shishhed basin (upper Enisei) before 1980 was distributed 7 native fish species. Now 10 fish species from which Coregonus peled, Coregonus autumnalis are introduced, Leuciscus baicalensis is naturally dislocated.

Dace - Leuciscus is widely distributed from Barzug to Pechory and in Bolga, Ural and in Siberian rivers and lakes of the of Arctic ocean drainage in Russia. Two subspecies are usually recognized as follows: Leuciscus leuciscus (L) from European Russia and Leuciscus baicalensis (Dybowski from Siberia). Siberian dace inhabits in all tributaries of the Selenge river basin (Tuul, Eroo, Orkhon, Eg, Delger moron, Ider, Chuluut) in Mongolia. (The Fishes of the MPR 1983.)

According to local fishermen, over the last 2-3 years has been observed a new invasive species (in local name Roach of Cyprinids) in Dood tsagaan lake of the Shishkhed river watershed. This species was discovered on 14 June 2009 as Dace-Leuciscus baicalensis. (N51°19'398” E099°22’390). The total length of 2 specimens was fluctuated 180-210 mm, with the average in 19.5 cm.

Since 1956 fishing was established in Dood tsagaan lake of the Shishkhed river watershed and until today. According to the fishing data, show that during over 50 years Dace species never observed in this watershed. During the last few years continuing dry period in Darkhad depression. This species might be migrating up to Darkhad depression when the water level and discharge was drops, which is related to climate change

Thymallus arcticus is a fish species globally distributed in Ob River Basin to the Chukotsk, Kamchatka Peninsula tributaries of the Pechora, Korotaikha and Kara rivers (Russia) and North America and regionally inhabitant in Shishhed and Selenge river watershed of North Arctic Ocean drainage basin (Mongolia). In general, the Arctic grayling exhibits a very complex intraspecific structure and encompasses several ecological forms (Tugarina.1972, 1981; Reshetnikov et al., 1976).

On 15 July 2005 we recorded one specimen of Arctic grayling in the Borshoo gol, which is feed Uvs lake from north west. Two further groups of Thymallus population have been referred to as T. arcticus in Mongolia : one in the Great Lakes Basin and one in the Irtysh headwaters on the slope of Altai (Khurint, Songinor, Yolt; Baasanjav , Thend Ayush, 2001) There is no information on Irtysh populations either in Mongolia or China, except for a description and figure in Anonym, 1979 and only limited for Kazakhstan (Mitrofanov et all., 1986) and not find usable information on the populations of the headwaters of the Khovd and Zavkhan river basin (Kottelat, 2006). In all water bodies of Western Mongolia only one species of grayling – the Mongolian grayling (Knizhin et all., 2008). According to our measurements, grayling from Borshoo gol is very similar with grayling from Shishkhed river watershed and also distinguished from all other Thymallus in
Mongolia by its color pattern. The grayling might be introduced in to the upper part of the Borshoo river in Russian side. This is a mere hypotheses which needs to be tested.

In Khalkh gol river watershed the records of large-bodied Chinese carps (Ctenopharyngodon, Hypophthalmichthys, and Parabramis) in Lake Buyr are the result of stocking activities on the Chinese side of the lake.

In 2006 Neely, D.A. and others reported the first record of the family Gobiidae from Mongolia, of an invasive cyprinid, Abbottina rivularis Basilewsky and Rhinogobius sp. in Lake Buyr, Mongolia. This species is native to eastern China, Korea, and Japan (Masuda et al. 1984) but has been widely introduced outside of this range as the result of stocking "mixed carps" for fisheries enhancement (Yang 1996). Species of Rhinogobius have been introduced widely outside of their native range in China.

Rhinogobius lindbergi Berg 1933 (Berg 1965, Novomodny et al 2004). Rhinogobius lindbergi had never been previously reported from Mongolia (Kottelat 2006), and was known to extend upstream only to the vicinity of the mouth of the Bidzhan River, ~47.7 N 132 E (Berg 1965).
MECHANISMS OF GLOBAL WARMING EFFECTS ON INVASION SUCCESS OF SMALL AND LARGE CLADOCERAN SPECIES

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In experiments with mono- and polycultures the hypothesis that small-size cladoceran species (*Daphnia magna* Straus and *Simocephalus vetulus* O.F. Müller) are more successful at higher temperatures whereas large-size species (*Diaphanosoma brachyurum* Lievin and *Ceriodaphnia reticulata* Jurine) under low temperatures was tested. The biomass of *Simocephalus vetulus* exceeded the biomass of the other species both in mono- and polycultures. An increase of temperature from 18 up to 25°C led to reduction of the biomass of all species. The largest species, *D. magna*, responded to higher temperature by increased mortality. We assume that the reduction of the biomass of the large species allowed the small *C. reticulata* to develop successfully in mixed cultures at higher temperature; however it was completely eliminated at lower temperature. Apparently, the survival strategy of large cladocerans involves delayed juvenile development at lower temperatures. However, at higher temperatures, juvenile development of large species accelerates, and their mortality increases. Individual strategies of the studied species to survive at different temperatures were analyzed. It was shown that enhanced temperatures provide long periods of food depletion, thus strengthening interspecies competition. Hence we expect lower biodiversity of the communities at warm waters. On the whole the increase of temperature can result in decrease of the biomass of cladocerans and prevalence of small-size species over large-size ones.
OF THE IMPORTANCE OF INVASIVE SPECIES OF ZOOBENTHOS IN THE ECOLOGICAL SYSTEM OF THE VOLGOGRAD RESERVOIR

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Hydro construction which started on Volga resulted in lowering the river flow. Ground fauna in the section of that of the Volga River, which was changed into the Volgograd Reservoir, within the period of the first 5 – 6 years of making ecosystem of the reservoir had acquired lake character (Konstantinov, 1969; Belyavskaya, 1975).

Intentional introduction of fodder invertebrates into the Volgograd Reservoir from the deltas of rivers Don and Volga (Polychaeta and Mysidae) had ambiguous results. Introduction of Mysidacea did not bring to the expected long-term effect of enriching of the fodder basis of the reservoir. Outbreak in quantity and biomass of Mysidacea of short duration in the late 60s came within the following years (Belyavskaya и др., 1969; Dzban, Borodich, 1972) to the level which was initial for this reservoir (Filinova, 1983). Polychaeta *Hypania invalida* (Grabe) disseminated fast throughout whole reservoir and at present occurrence in different sections reaches 30 - 50 %.

The practice of acclimatization aimed at introduction of fodder invertebrates activated invasion of species accompanying the transferred species into the basin. Flourishing of planned introduced species – *H. invalida* was followed by the entailed invasion of Hirudinea *Archaeobdella esmonti* Grimm, 1876, preying on Polechaeta and Oligochaeta. Occurrence of leeches on separate biotopes inhabited by Annelida reaches 30%. These predators are food rivals of fish feeding with benthos. Among occasionally introduced species the most flourishing are *Adacna* (Monodacna) *colorata* (Eichwald, 1929) – the frequency of occurrence in the open section of the reservoir was up to 50% of samples (Filinova, 2003). Nevertheless by now it is a species which is seldom met in the reservoir.

Invaders *Dreissena bugensis* (Andrusov, 1847), have acquired great importance in the basin in the end of the current decade. Within the river-bed sections they dominate everywhere developing on the ground of the basin on any types of bottom unlike the mollusks which are native for this reservoir. These native molluscs *D. polymorpha* (Pallas, 1771) need additional substratum on silty types of ground to raise them above the thick silty sediments. With average many years biomass 1390 g/m², *D. bugensis* is capable to filter huge mass of water precipitating seston. As far as unicellular water-plants and detritus make the food, it undoubtedly competes with the dominating kinds of zooplankton. And preying on small forms of zooplankton allows characterizing it also as a rival to species feeding with organisms which live in water. This species is bio zenos-making in the reservoir and directly or indirectly it influences the development of other representatives of zoo benthos and plankton inhabitants of the basin.

By 2004 in the bottom fauna there were 12 invasive species; out of them 10 – of ponto-casian origin and 2 – from other regions (Filinova, Malinina, Shlyakhtin, 2008). Within the last five years we have identified other 11 new species of ponto-casian fauna and 1 – from other regions. The speed of expansion in the reservoir of the allochthonous or non-native species has increased within the recent years compared to previous decade and reached 2 species a year.

Invasive species in the open part changed quantitative characteristics and structure of the bottom fauna considerably. They form about 98% of quantity and 99. 9% of biomass of the whole zoo benthos, and about 30 % of quantitative indices of the soft zoo benthos.
Detailed description of *D. caspius* and its distribution in the Caspian Sea was first made by Sars (1894). In the works of successive researchers occurrence of this species beyond the Caspian Sea was mentioned for the mouth of Volga only (Lebedev, 1907; Derzhavin, 1912), it also had not been seen in the zoobenthos of Volga before the flow was regulated (Zhadin, 1950; Liahov, 1958).

Pallas P.S. (1771) when describing the species mentions its occurrence in the thicket of water plants. Birschtein Ya.A. and Romanova N.N. (1968) point that this salinity resistant species can be found in the Lower Volga and in the shallow water of the middle part of the Caspian Sea on stony ground among thicket Laurencia sp. Detailed study of the fauna of the Volga shallow water covered with thickets in 1960-80 had not resulted in revealing this species in zoophytes (Konstantinov, 1971; Kashirskaya et al., 1986). We found *D. caspius* first in the zoobenthos of the shallow water covered with thickets in the lower part of the Volgograd Reservoir in the early 1980s (Nechvalenko, Filinova, 1983). Ten years later occurrence of these amphipoda in the shallow creeks of the middle and lower zones of the Reservoir reached 18% (Filinova, 2003). In the period of 1996-99 hydrobiological study of the shallow waters of the Volgograd Reservoir was suspended.

Since the beginning of 2000s and up to now we regularly register *D. caspius* in zooperiphyton of water plants in all zones of the Volgograd Reservoir (Malinina, Sonina, 2003; Sonina 2008); it makes 15-80% of general abundance and 31-95% of overall biomass of Gammaridae. In the beginning of the period mentioned in zoobenthos on different shallow biotopes occurrence of this species made 6 - 30%, by the end it reached 14 – 50%. *D. caspius* was found in considerable amount in Dreissena druses on the depth of 1.5 m. Maximum amount of these amphipoda in zoobenthos was registered in flood-lands of the upper and middle zones where depth was 0.5 – 0.7 m on sand with detritus. In the deep water river-bed part of the Reservoir this species was not seen.

*D. caspius* reaches the most quantitative indices of development in zooperiphyton of water plants of the upper river zone, which differs from the lower sections by substantial areas of shallow water. Most preferable substrate for juvenus *D. caspius* appeared to be thickets of *Elodea canadensis* Michx. The most number of *D. caspius* in the thicket of *Potamogeton perfoliatus* L. was noticed in June, biomass – in July.

Within the thirty years period of our study we observed advance of *D. caspius* up the Volga River, while the northern border of natural habitat was moving gradually and a steady tendency to increase of its role in the fauna of Crustaceae of the shallow waters covered with thickets appeared. In the following years the occurrence of this species on the shallow parts covered with water plants in the upper situated Volga Reservoirs is quite possible.
INVASION OF ALIEN SPECIES IN HOLARTIC. BOROK – 3

THE NEW RECORDS OF *POTAMOPYRGUS ANTIPODARUM* (GRAY, 1843) IN FRESH WATER BODIES OF KALININGRAD REGION (RUSSIA)

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The aquatic snail *Potamopyrgus antipodarum* Gray, 1843, well known as the New Zealand mud snail, was first found in the western Baltic Sea in 1887 and recognized as *Hydrobia jenkinsi* Smith, 1889. This species is native to New Zealand where it was colonizing into Australia and Tasmania, and later introduced to Europe in drinking water barrels on ships from Australia (Иеjка et al., 2008). In Russia, *P. antipodarum* was known from the eastern Gulf of Finland, estuaries of the Baltic Sea and Lower Don Basin (Gasunas, 1959, Son et al., 2008).

Gastropod molluscs were collected during summer 2008 on the littoral zone of four reservoirs – three artificial lakes (last sand-pits) and river. These lakes (Lake Forelevoje and Golubuje Lakes) are represented a grope situated along the shore of SW Kaliningrad Gulf (the part of Vistula Gulf aquatory) and belong to oligotrophic type. The sand and sand-gravel substrates are dominate in lakes. In Zelenogradka river molluscs samples were collected along the low stream.

Beside the differences between mollusc specific structures in studied water bodies, *P. antipodarum* was found in either water body as dominant mollusc, which occurs in the high density: 206 ind./m² (Forelevoe Lake), 864 ind./m² (Zelenogradka River), 237 ind./m² and 1023 ind./m² (Golybie Lakes).

These snails were found in some localities in the various littoral habitats: sand, pebble, rocks in lakes along all the inshore aquatory of lakes, in which connection some of habitats such as filamentous alga aggregates covering branches and boulders include *P. antipodarum* findings in Golubuje Lake. This scpecies abundance occurred in some localities with density reaching 1884 ind./m² during one month. While in Golube Lakes mollusc biomass is low, no large mollusc species found in these water bodies. The value of biomass in Forelevoe Lake is higher due to larger gastropods such as *L. stagnalis* and *B. tentaculata* habitation. The specific diversity gastropod level in Forelevoe Lake is higher than in other ones because of Forelevoe lake water area exceeds in several time.

At the same time these molluscs inhabit actually on macrophytes (especially on brandy-bottle and sagittaria) in river, where were disclosed only on one river section. This species is distributed as were estimated restrictedly through the river, but specific diversity is dramatically decreasing on the point of invasion. The occurrence reaches 97 %, the Shannon index shows minimal mean here (H = 0,16). Zelenogradka River is uncluded in water basin of the Curonian gulf; therefore *P. antipodarum* colonization takes place through the gulf, where this mollusc was first found almost one hundred years ago by Szidat (1926).

*P. antipodarum* is colonizing the groupe of lakes, when dispersing from Vistula gulf. It has become a prevailing species during last years in the gulf and inhabits in abundance involved in main zoobenthic communities (Rudinskaja, 2004), but its occurrence was first described by Vanhüffen (1911). Investigated lakes are connected with Vistula guls by the channel, which influences both on salinity of water and *P. antipodarum* distribution in these water bodies.

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NATURALIZATION AND DIET OF NEWLY INTRODUCED FISH SPECIES -
PROTERORHINUS MARMORATUS IN THE UPPER PART OF KUIBYSHEV WATER
RESERVOIR (MIDDLE VOLGA, RUSSIA)

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The main goal of this study was to analyze the diet spectrum, quantitative characteristics of
feeding and trophic features of tubenose goby (Proterorhinus marmoratus), a new gobiid invader in the
upper part of the Kuibyshev water reservoir. Tubenose goby was discovered in the Volzhsky stretch
(48°43' E, 55°47' N) of the reservoir in 2004 (Galanin, in press). The tubenose goby specimens were
captured in September 2006 and in July and September 2007; they ranged from 15 to 49 mm in standard
length (average 29.2 mm; SD 2.8).

A total of 24 food types, representing eleven systematic groups of invertebrates were
found in the diet of tubenose goby. Young fishes were feeding on large near-bottom
zooplankton, mainly representatives of the Family Chydoridae. In contents of intestines
prevailed, benthic, badly floating species, such as Acroperus harpae, Eury cercus lamellatus.
Older fishes fed more on Amphipoda (Chelichorophium curvispinum), Copepoda
(Canthocampus staphylinus), but gut content consisted mainly of small insects, inhabiting zone
of macrophytes and Diptera larvae, dwelling soft sediments (Chironomidae). Mollusks
(Dreissena polymorpha, Lythoglyphus naticoides), although very abundant in the investigated
part of the Kuibyshev reservoir, were not used for food by tubenose goby. It is connected to
length-weight characteristics of tubenose goby and their strict preference of the certain type of
microhabitats (coastal macrophytes zone).

To characterize the intensity of Gobiidae nutrition, gut fullness coefficient (FC) was
monitored. Mean indices of stomach fullness were relatively high (112.0±13°/ooo). It indicates
high intensity of feeding and, consequently, good food provision of tubenose goby in Kuibyshev
water reservoir.

A relatively smaller success of invasion of tubenose goby and their uneven distribution in
the Kuibyshev reservoir can be explained by specific features of their diet: tubenose goby keeps
feeding mainly on benthic zooplankton and small water insects. They compete with juvenile
fishes and many other fish species. Another invader from the same family, round goby
Neogobius melanostomus, consumes mainly Dreissena that is not so much on demand as a food
object.

In food of Tubenose goby were practically absent Ponto-Caspian invertebrate invaders,
numerous in the reservoir. I.e. in our investigation we did not found confirmation of "invasional meltdown" model of Simberloff – Von Holle. Establishment of round goby in Kuibyshev water reservoir appears not to be facilitated by other invaders from the same region of origin.
SOME DATA ON A FEEDING OF STARRY GOBY BENTHOPHILUS STELLATUS SAUVAGE, 1874 IN THE CHEBOKSARY RESERVOIR

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Benthophilus stellatus Sauvage, 1874 is registered in the Cheboksary reservoir with 2002 y. (Klevakin, 2003). Data on growth of this species are resulted by A.A. Klevakin and V.V. Loginov (2008). It is noted, that observable rate of growth in a population gobies the Cheboksary reservoir, below those in an initial area of their dwelling. In the given work data on a feeding of different dimensional groups of this species are resulted. The material has been collected by A.A. Klevakin from trawling catches during a summer season of 2007. Processing of a material was made under Methodical recommendations …, 1984; Kurashov, 2007; Kotlar, 2004.

Three samples with a various dimensional category (4,2-5,0 sm, 5,8-6,2 sm and 6,3-6,7 sm), on 10 individuals in everyone have been selected. Quantity of systematic groups of fodder organisms defined and their percentage parity on weight was determined in each dimensional category.

The basic share of a biomass bolus, in all dimensional groups, is made with small Caspian gastropods – Lithoglyphus naticoides (Table).

The diet in a younger dimensional category (4,2-5,0 sm), numbering as a whole in an intestinal path of Starry goby up to 12 regular groups of fodder organisms is most various. More than half of percent of a biomass make mollusks of them. An important role in a feeding of a whitebait of a fish, after mollusks, play also Ostracoda and early larvas of Procladius. Besides, early stages oligochaeta, amphipods, larvae of trichopterans, ephemeraenses, sponges, hook-worms and organisms of zooplankton are noted in boluses.

In a 5,8-6,2 sm dimensional category, in an intestinal paths, 9 groups of fodder organisms are revealed. More than 80 % of a bolus biomass make mollusks. Among other fodder organisms Dikerogammarus haemobaphes, sponges and bloodsuckers Erpobdella nigricollis prevail.

In the senior category (6,3-6,7 sm) 6 groups of fodder organisms are noted. In bolus also more than 80 % of a biomass belong to mollusks. The remained part is made by larvae of chironomids with prevalence of Chironomus and freshwater hoppers – Stenogammarus dzjubani.

The dimensional category is more senior, the smaller amount of groups of fodder organisms enters into a feeding of Starry goby. Organisms of meiobenthos have the great value in a feeding of a young fish. Their value essentially falls among the senior dimensional groups.

Thus, the main food component for Starry goby is the caspian invader – L. naticoides. Quite possibly, existence Starry goby in the Cheboksary reservoir became possible owing to earlier installation of L. naticoides. This is typical example of the integrated invasion.

Gratitude. We thank A.A. Klevakin for granting of a materials.
TEMPERATURE ADAPTATIONS OF SPECIES-INVADERS

AND NATIVE SPECIES OF FISHES. THE COMPARATIVE ANALYSIS.

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Various aspects of mutual relations of species-invaders with native species – a subject of numerous field researches and publications. At the same time, ecological and physiological properties of both groups in relation to factors of environment are studied obviously insufficiently. Experimental researches of temperature adaptations of species-invaders are extremely rare, and species-natives – while are insufficient. Taking into account that practically any specie can appear in a role invader, the comparative analysis lethal (ability to live borders) and selected (the ecological optimum) temperatures represents doubtless interest.

Rotan goby Percottus glenii Dyb. in comparison with species it appears is steadier against temperature influences, than bream, roach, perch, is only a little conceding to very thermophilic carp and a crucian. Common Caspian kilka Clupeonella cultriventris Nordman could promote on an area upwards, obviously, owing to their thermoadaptation properties. The Caspian species tubenose goby Proterorhinus marmoratus (Pallas), caught in литорали the Rybinsk water basin and bighead goby Neogobius kessleri (Gunther), occupy, judging by their thermopreferendum, higher temperature niches, than a gudgeon, groundling, but less low in comparison with bream, roach, perch (Verbitsky etc., 2005).

Thus, potential eurithermia or stenothermia of species-invaders, and also difference of their thermoadaptation properties from native species can form a basis of successful distribution of invaders in new areas.
EFFECTS OF NATURAL AND ANTHROPOGENIC FACTORS UPON CARBOHYDRASE ACTIVITIES IN ALIEN SPECIES.

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The Amur sleeper *Percottus glenii* Dyb. and kilka *Clupeonella cultriventris* Nordman have recently appeared in the Rybinsk Reservoir. Their feeding are in detail investigated, however the data on digestive enzymes activities were absent. As carbohydrates play a considerable role in a plastic and energy metabolism, the work purpose consisted in determination of intestine and whole-body carbohydrases activity in fish in norm, and under the separate and combine effects of temperature, pH and biogenic metals Cu and Zn in vitro.

The amylolitic activity (AA) in kilka intestine is similar to those in others planctophages, in the Amur sleeper is close to those in typical benthophages. Intestinal AA decreased on 8–38 % in the presence of Cu and Zn within a range of concentrations 0.1–25 mg/l. Whole body AA of the juvenile fish serving as potential feeding items for piscivores are close to those in perch, but in 2–6 times low than in cyprinids. The low temperature, acid pH, and Cu and Zn at separate and joint action considerably reduce enzyme activities, reducing the potential contribution of victim enzymes to consumer digestion. The temperature optimum of starch hydrolysis (50°C) in intestine of alien species is equal to those of other fish from the Rybinsk reservoir. However, the sleeper’s carbohydrases are more tolerant to the increase in water temperature during winter than similar enzymes in cyprinids. Thus, the carbohydrases activity and their stability to natural and anthropogenous factors are comparable to those of native fish species from the Rybinsk reservoir.
Invasion of Alien Species in Holartic. Borok – 3

Feed of the Coregonus Peled and Coregonus Autumnalis Migratorius from Krasnokamenskoye Reservoir and Their Influence on the Forage Reserve

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Influence of fishes is reflected in seasonal and interannual development of planktonic community. Installation of C. peled and C. a. migratorius in Krasnokamenskoye reservoir has led to appreciable changes of the zooplankton qualitative and quantitative parameters.

Krasnokamenskoye reservoir is located in the south of Transbaikalian area, its has been formed in 1974, the area is 2.2 km², the maximal depths of 15 m, average of 6.5 m. Since 1975 сиговых is spent installation for fish productivity increase. Studying of a forage reserve and a fish feed was spent to the summer-autumnal period. A Daphnia pulex made basis of the zooplankton number and a biomass during the summer (22 thous.ex. m$^{-3}$ and 3.0 mg m$^{-3}$) in the first years of reservoir existence (Itigilov а, Gorlachev, 1985). It made a basis of a fish diet. Thus rate of Coregonus fish growth was high. In the further the condensed landings of Coregonus have led to decrease in a zooplankton biomass up to 0.15 mg m$^{-3}$ in spring and up to 1.5 mg m$^{-3}$ in autumn. The number of cladocera has sharply decreased. Rates of fishes growth has decreased also.

Thus, the raised density of C. peled and C. a. migratorius render significant influence on the zooplankton structure and a level of quantitative development. A rates of growth, fatness and security necessary forages decreases also.
**INVASION OF** *EPHEDRA SINICA* **STAPF. IN THE DRY-STEPPE ECOSYSTEM OF MONGOLIA**


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*Ephedra sinica* Stapf. is a xeromorphic gemipsammophyte evergreen shrub of a petrophyte rhizome type, poor eaten, and in some seasons poisonous, which prefers rocky and stony habitats on slopes of mountains and hills, pebbly bottoms of sairs or semi bound sandy terrains.

This species is most widely distributed in mountain ecosystems of Gobi Altai and Mongolian Altai, Gobi Tien-Shan, the southern macro-slopes of Khangay, and in hills of the desert-steppe zone (North, East Gobi and Alashan) and less often in the steppes of Central Khalkha and Eastern Mongolia (Yunatov, 1954, 1974; Grubov, 1955, 1982; Volkova, 1976; Karamysheva, Banzragch, 1976; Banzragch et al, 1978; Dariyma, Ulziyhutag, 1984; Steppes of Eastern Khangay, 1986). Most researchers point out to rare occurrence of *Ephedra sinica* communities in all zonal types of ecosystems such as steppes and deserts. Later P.D. Gunin et al (1993) identified the expansion of *Ephedra sinica* in plakors of different levels in the inter-mountain valleys and piedmont plains in some parts of Gobi Tien-Shan. There is currently invasion of *Ephedra sinica*, not only on plakors of desert steppe (Kazantseva, 2009), but also northward (above N 47°) in zonal ecosystems of the dry steppes of Central and Eastern Mongolia. In this report we consider the expansion of *Ephedra sinica* with reference to Bayan-Undzhul soum of Central aimag and Tumentsogt soum of Suhebator aimag, a comprehensive study of ecosystems which are held in 1970-s.

At that time on the territory of Bayan-Undzhul soum in the northern and southern parts Caragana-grass communities were most common. Currently, they are transformed into Caragana - Ephedra communities. Aboveground phytomass of *Ephedra sinica* is quite high (26-43% of the total), and the projective cover is 10%. This shrub has a good living condition; its size reaches 30-54 individuals per m². In the north-western part of the soum on hilly plains a monodominant *Ephedra* community is widespread. Total projective cover reaches 50%, of which a half are *Ephedra sinica* that formed 40% of the phytomass. Total aboveground phytomass in this community reaches 18 centner / ha, of which 60% accounted for annuals. Grasses (*Stipa krylovii, Cleistogenes squarrosa, Leymus chinensis*) in these coenoses reveal poor living condition, they are stunted, their projective cover is only 2-8%. In the dry steppes of Eastern Mongolia in the low hills on the steep slopes of hills of south-eastern exposure, a dense shrub communities (*Armeniaca sibirica, Spiraea aquilegifolia, Caragana stenophylla, Lespedeza dahurica*) in combination with petrophyte-motleygrass steppes *Ephedra* reaches its maximum abundance (estimated coverage 30%). The high abundance of *Ephedra* (15%) is noted in Caragana-Stipa-grass steppes developed on hills’ slopes with sandy soils. On gentle slopes of low hills in the Stipa-grass steppes and in the elevated plains Leymus-Cleistogenes-grass communities abundance of *Ephedra* reaches 3%. The initial stage of *Ephedra* expansion can be stated on the gentle slopes of low hills with Caragana-motleygrass-sedge-grass-Stipa steppes on more developed rich soils on tops of hills with motleygrass-onion-grass steppes, and with the motleygrass-Stipa-Leymus steppes on plains.

Thus, our study has revealed for the first time the between-landscape invasion of *Ephedra sinica* in dry grassland ecosystems of Mongolia, which is likely because of the release of ecological niches in the grass communities due to prolonged drought and significant grazing pressure.
ROLE OF BAIKAL AMPHIPOD IN THE FEEDING OF ONEGA LAKE FISH

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Penetration of new species into water ecosystems has been one of essential environmental problems in many Russia's water bodies over the past few decades. To improve the food supply of fish, attempts to introduce Baikal side-swimmer (Baikal amphipod) *Gmelinoides fasciatus* (Stebbing) into water bodies of the former USSR have been made since the 1960s. In the 1980s, Baikal amphipod was introduced into the lakes of the Ladoga basin to which it adapted itself and then self-invaded Lake Ladoga. At present, it is especially abundant in the Ladoga Lake shore zone, where it predominates. The amphipod penetrated into Lake Onega through the River Svir and the Volga-Baltic Channel. The colonizer was officially reported in 2001 from some sectors of the rocky and sandy littoral zone in south-western Lake Onega.

The study of the dynamics of the population indices of Baikal amphipod shows that it is becoming more abundant in Lake Onega. However, its role as food for lake fish is still unclear. The goal of our project was to assess the role of Baikal amphipod as food for Onega Lake fish. To assess the role of Baikal amphipod as fish food, the feeding of perch (*Perca fluviatilis*), the most abundant species in the littoral zone of Petrozavodsk Bay of Lake Onega, was studied. The age composition of catches (July 2009) was represented by individuals of three age groups (3+-5+) dominated by 4- to 5-year-old fish (89%). The fish had an average size (ad) of 13.6 cm (12.5-16.5 cm) and a body mass of 45 g (34-65 g). No substantial differences in the feeding of the different age groups of perch were observed. The qualitative composition of perch’s food was generally diverse. Benthic organisms dominated in frequency of occurrence and biomass (over 90%). Mayfly larvae (69%) and Baikal amphipod (16%) were most abundant, and chironomid and oligochaete larvae were far less common. Planktonic organisms were dominated by coastal forms of copepods and cladocerans (about 2%). Mayflies (49%) and amphipods (46.9%) dominate in weight, and the percentages of other organisms are small (Fig. 1). The index of fullness of the fish was not more than 207.50/000 (37.7–207.5), the average index being 105.50/000. Perch was not observed to predate, which could be due to both the fishing season (late July) and the shoreline pattern (a breaker zone and the absence of macrophytes).

Analysis of the data obtained has shown that a benthic type of feeding dominated in the 4th-6th year of perch’s life during the study period. The fish that inhabited the littoral zone actively consumed Baikal amphipod, a new food. The colonizer made up 46% (in biomass) and 16% (in frequency of occurrence) in the stomachs of juveniles. The invasion of Lake Onega by Baikal amphipod has thus resulted in the changed structure of littoral biocenoses and the appearance of a new food type for fish.

The abundance of amphipod in Lake Onega has increased considerably, but it is not clear in which growth phase of quantitative characteristics the invasive species is (the colonizer has been living in the lake for almost 10 years). Considering the resistance of Baikal amphipod to unfavourable environmental factors and its biological characteristics, it is also important to study the ways of its areal expansion and the opportunity to penetrate along tributaries to other water bodies of the Onega Lake basin.

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Now 7 alien species of fishes are known in the basin of a middle course of Oka river (the Ryazan region).

*Neogobius fluviatilis, Proterorchinus marmoratus* and *Sabanejewia baltica* are usual in the Ryazan region in the Don basin. For Oksky basin in borders of region they are noted for the first time. *Neogobius fluviatilis* is found in July, 2009 in Oka near Kasimov, *Proterorchinus marmoratus* in August 2009 in Oka tributary - the Rubetsky source. Unlike these species which were already marked in Oksky basin (Дякина, Королев, 2008; Цепкин, Соколов, 1996), *Sabanejewia baltica* for the first time it is noticed in June 2007 in Oka tributary - Khupta, that, it is possible to consider as the beginning of expansion by a species of new river basin.

*Benthophilus stellatus* in the Oka river has appeared rather recently. For the first time about dwelling of this species in the Oka river it became known in the summer of 2002 when one individual has been caught at Spassk (Иванчева, Иванчев, 2004).

*Neogobius melanostomus* in the Oka river is found out for the first time in 1980th (Бабушкин, 2001). Subsequently it was widely settled across Oka and now lives, probably, on all its extent within the Ryazan region. By present time this species besides the Oka river is noted in its tributaries - Pronya and Para (Иванчев, Иванчева, 2010).

*Pungitius pungitius* is noted in the Ryazan region in the end of 60-s’ years (Бабушкин, 1990). Its find in November, 2009 on Bystrets river flowing on the regional centre is interesting.

*Perccottus glenii* meets in the Ryazan area from the beginning of 70-s’ years. Now it was widely settled on various types of reservoirs and water currents of the Oksky pool.
ALIEN SPECIES OF PLANTS IN AQUATIC ECOSYSTEMS OF VJATKA-KAMA REGION

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In the territory of Vjatka-Kama Region the growth of 22 species of the alien vascular macrophytes is noted. They make 6.5 % from the number of the region's known species of macrophytes. The majority alien species of macrophytes are not active participants of vegetative communities formation and they are a part of aquatic communities as accompanying elements (Amaranthus retroflexus L., Chenopodium glaucum L., C. rubrum L., Xanthium strumarium L., Epilobium pseudorubescens A. Skvorts., Juncus gerardii Loisel., Senecio vulgaris L., Typha laxmannii Lepechin, Mimulus guttatus DC., Butomus junceus Turcz., Scirpus tabernaemontani C.C. Gmel., Zannichellia repens Boenn.). They grow on secondary and open natural ecotopes. The given species do not represent now the big threat for ecosystems of the region's reservoirs as they have the lowest activity in aquatic communities.

Among considered group there are also invasive species. They include Najas major All., Vallisneria spiralis L., Phragmites altissimus (Benth.) Nabille., Juncus tenuis Willd., Echinochloa crusgalli (L.) Beauv. They strongly became a part of secondary biotopes communities, but they represent threat for aboriginal species of macrophytes only in the specific ecotopes which parameters considerably deviate from the normal. Probably, their wide expansion to water ecosystems of region may be expected in the future. Also the group of invasive species contains Elodea canadensis Michx., Epilobium adenocaulon Hausskn., Impatiens glandulifera Royle, Mentha longifolia (L.) Huds., Lemna gibba L., naturalized in natural ecosystems or actively taking root into them. Some of them have already finished the process of accessible biotopes capture, others, developing own niche in ecosystems, behave rather aggressively.
In less than four decades, *Pseudorasbora parva* has demonstrated its invasive potential by colonizing the majority freshwaters body of continental Europe. Established populations of *P. parva* have now been found in the wild, in large numbers, at several locations in delta and middle part of the stream of the Don River. The data on a morphological and genetic variety of *P. parva* are described. Carrying out the isozymes analysis has shown, that a lobe of polymorphic locuses \( P = 21.05-31.52\% \) (at criterion 0.95), general heterozygosis \( H = 11.0-12.5\% \) (S.E. 0.047), average quantity of alleles on a locus 1.42-1.47 (S.E. 0.16). Some morphological characters *P. parva* from Don River are characterized by the following magnitudes. Number of rays in a back fin (D) 6-7, 6.97±0.06, number of rays in an anal fin (A) 5-6, 5.97±0.06, number scales in a lateral line (l.l) 35-38, 35.9±0.72, number scales above a lateral line (SD) 5-6, 5.03±0.06, number scales under a lateral line (SA) 3-4, 3.97±0.06, the formula of pharyngeal teeth (d. ph.) (5-4) - (5-5), most frequently met (5-5). Total of vertebra (Vert) 33-37, M±m=35.43±0.18. Quantity of vertebra on departments: in a thoracic department (not considering 4 vertebra of the Veber’s apparatus) Va (9-13), most frequently met (12); in the interjacent department Vi (3-5), most frequently met (4); in a caudal department (not considering of three accrete final vertebra) Vc (12-14), most frequently meeting (13).
Invasive fishes are gaining increasing importance, in the fauna structure of the Pont-Caspian region, lately. Kilka, *Clupeonella cultriventris* Nordmann, 1840 is one of the most active, in this respect, species. This work is devoted to studying of variability of alleles frequencies of lactate dehydrogenase (LDH, E.C. 1.1.1.27) of kilka’s various populations. At the analysis of distribution of frequencies LDH alleles it was fix three mainframes - freshwater reservoirs (water reservoir of the Volga cascade), water reservoirs with this or that concentration of salts - sea type (Sea of Azov and Caspian Sea) and saltish-waters type. Most likely, such features are linked to existence of two big physiologic races of kilka - sea and saltish-waters and freshwater-Volga races. If this assumption is true, in this case allele LDH-A’120 it is possible to name "Volga"-allel. The assumption of communication of concentration of allele LDH-A’ with a salinity of an inhabitancy of a concrete population is put forward. Probably, successful development of resources of boreal water reservoirs (in particular Rybinsk res.) descended due to individuals - «sea leaders».
Invasion of kilka into the Rybinsk water reservoir took place rather recently – in 1994 (Tereshchenko, Strelnikova, 1997). At present, kilka has spread throughout the whole waterbody and naturalized, forming the largest population among all Upper Volga water reservoirs (Kiyashko et al., 2006). The choice of Rybinsk water reservoir as target for monitoring is not accidental as this waterbody has an extensive lake part and river parts of different sizes.

Aim of the study was to examine and find the reasons of intrapopulation variability of vertebrae number in the abdominal (Va), sum of vertebrae number in the transitional and caudal sections (Vi+c) and total number of vertebrae (Vt) in kilka inhabiting different parts of the waterbody. Fish were caught in 2000-2006 using a pelagic trawl on 13 constant sampling sites encompassing 5 stretches of the reservoir: Volga, Mologa, Sheksna, Central and Near-Dam. We found that values of Vt, Vi+c and Va fluctuated significantly in different years of observations. Thus, in 2000-2002 – first years of observations majority of samples had highest values of Vt (43.3-43.6) and Vi+c (25.9-26.5), but lower values of Va (17.18-17.4). In the next years (2003-2004) a tendency towards Vt (42.9-43.2) and Vi+c (25.6-25.9) decrease appeared, while Va values remained the same. In 2005-2006 further decrease of Vi+c (25.4-25.8) took place, while values of Va (17.5-17.9) and Vt (43.15-43.4) have increased. However, Vt values observed in the last years have not reached numbers characteristic for first years of observations. Possible causes for observed dynamics of 3 features of kilka’s axial skeleton varied in different periods of observations. First, we have observed a rapid decrease of Vt and Vi+c in 2003 and 2004 after an extensive suffocation of fish which occurred in the Rybinsk water reservoir during the winter of 2002-2003. In our opinion, decrease of Vt values in these years is due to death of kilka individuals with a large number of caudal vertebrae (Vi+c). Experiments with carp have shown that multi-vertebrae individuals are more motile and have raised metabolism rate in conditions of acute oxygen deficiency comparing with individuals having lesser vertebrae which have lower metabolism rate (Tsui, 1971). Consequences of suffocation were fixated by assessment catches of kilka: they were minimal in 2003-2004 (2915 and 4627 spec. respectively) (data from Kiyashko V.I.). In other periods of observations (2000-2002 and 2005-2006) possible causes for found dynamics of values could be: 1. Different temperature conditions during early stages of development when vertebrae number formation in the two sections took place. This assumption is based on data obtained in the experiments with the White Sea herring (Khrustaleva, 1993), where it was shown that high temperatures (11° – 17°C) lead to increased number of abdominal myomeres in larvae of the White Sea herring Clupea pallasi marisalbi from 43,3 to 44,6, and decreased number of caudal myomeres - from 9,6 до 7.2. We can assume that in the first years of naturalization in the Rybinsk reservoir the majority of kilka fry were born from the first portion of eggs and vertebrae number formation took place at lower temperatures and therefore they had lower values of Va and higher values of Vi+c (2000-2003). Later, the base of population was constituted by individuals from the second portion of eggs and their development took place at higher water temperature. 2. Selection against long-tailed kilka individuals inhabiting the lake part of the water reservoir with slow flow. In order to overcome the strong current of the river part of the Gorkovskoe water reservoir kilka which first appeared in the Rybinsk reservoir (2000-2002) had longer tail due to higher Vi+c (Kasyanov, 2003). Later, after a few generations (2005-2006) new adaptive features started forming in kilka, such that are characteristic of limnophilous conditions of the water reservoir so that the number of vertebrae in the caudal section became lower. However, it is possible that both of these factors act simultaneously.
ON THE POSSIBILITY OF DETERMINING THE DEGREE OF DELAYING THE INVASIVE DANGER OF ADVENTIVE SPECIES OF PLANTS

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Theoretically, any species of plants can be transported to any part of the world and become invasively dangerous there. In practice through a number of reasons invasively dangerous are just a limited number of species and their invasion in the flora happens in different time periods. That is why it is more accurate to talk not about the invasive danger of the plant species but about the delay of their appearance. The delay should be understood as *a period of time in which the species is potentially able to invade the flora and achieve the high degree of naturalization in it*. The determination of this indicator, in our view, is possible through the analysis of spatial and temporary characteristics of the invasion of species in the flora. This kind of analysis can be based on the study of the specifics of separate species and species combination of the natural floras of the region which are potential species donors.

At the first stage, we analyze the checklists of the adventive floras of the world, as many floras as possible. It is evident that the more adventive floras are found the species of model natural floras the more it is possible to form an extended secondary area and the area is greater where the contact between the heterogeneous populations in the genetic structure.

At the second stage, it is important to find out how many stages of naturalization have passed and what period of time has been spent since the species’ invasion. Such data can be obtained only through the historical analysis of the adventive floras of recipient regions. As far as we know, such analysis has been done for a number of regions of Russia: Tula, Tver, Kaluga regions and the republic of Mordovia. The theoretical foundation to the historical analysis of data has been described in the paper (Khoroon, Zakharov, Sokoloff, 2006).

The results of the two-stage analysis are described in points which are added and ranged. The highest score is achieved by the species with a low degree of delay of invasive danger, the lowest – with the highest.
Pipefish Syngnathus nigrolineathus is native to the Caspian, Black and Azov Seas shallow-water and estuarine regions. Construction of reservoirs in the drainage basins of eastern European rivers have facilitated dispersal of this fish. S. nigrolineathus has established populations in the Kakhovskoye, Dneprovskoye, Veselovskoye, Proletarskoye, Tsimlyanskoye reservoirs on the Don and Dnieper rivers. This species has been recorded in 1962 for the first time in Kuibyshevskoye reservoir on the Volga river. Now it has established permanent populations in the Volga river Kuibyshevskoye and Volgogradskoye, Cheboksarskoye reservoirs. S. nigrolineathus could come to the Volga river reservoirs from the Caspian Sea basin or from the Black Sea basin or from the both of them. We used mtDNA cytochrome b and control region sequence data to study genetic variability and relationships of the S. nigrolineathus from natural (Black sea, Caspian sea, mouth Volga) and exotic locations (Volgogradskoye reservoir). Sampling sites of the Black and Caspian Seas were characterized by the highest within site variances. Both cytochrome b and control region data supported the divergence of the Caspian sampling from others.
THE NUMBER AND SPECIES DIVERSITY DYNAMICS OF FISH’S PELAGIC ASSEMBLAGES IN RYBINSK RESERVOIR AFTER INVASION OF *CLUPEONELLA CULTRIVENTRIS* NORDM. (CLUPEIFORMES, CLUPEIDAE)

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After the invasion of *Clupeonella cultriventris* Nordm into the Rybinsk reservoir in 1994 the number of its population began to grow consecutively and by 2000 it became the prevailing component of the pelagic association of fishes that undoubtedly testifies about the success of naturalization. Before this invasion the pelagic association was depressed according to the parameters of number and range of species. After disappearance from the reservoir the super-dominant of association - smelt from the pelagic zone, the predatory component of the associations – Percidae displaces into the littoral and sublittoral zone. Thus, up to the moment of *cultriventris* Nordm Clupeonella’ s invasion the pelagic zone of Rybinsk reservoir is a free ecological niche. The subsequent ten-year period after its naturalization is distinctly subdivided into two temporary stages. During the first stage (from 2000 until 2003) sardelle absolutely prevails in the pelagic zone and gradually increases its number. In this case, an increase in the number of both the mature and the young individuals occurs according to the classical models of completion. In the second stage, which has begun since 2003 and is still going on, other forms, first of all, Percidae (pike-perch, perch) are returning to the pelagic association. By 2005 the structure of the pelagic association in Rybinsk reservoir becomes newly multi-specific, and Percidae together with the sardelle are the subdominants of the association. The number of mature sardelle here is reduced though the number of young individuals is not only growing, but also reaches completely high indices. The latter undoubtedly testifies about good conditions of sardelle’s reproduction in Rybinsk reservoir. The basic regulator at the number of its population during the first stage was elimination of individuals, first of all young individuals (especially late summer -autumn generation) in winter period. After the recreation of multi-specific association, to the factor of winter selection the factors of food competition from the side of young of Percidae and corrosion by predators (perch and pike-perch) are added. So, taking into account its short life cycle, the joint action of these factors unavoidably lead to significant reduction in the number of mature fishes and the increasing in the number of predatory forms.
ACCLIMATISATION POSSIBILITY IN UKRAINE QUARANTINE KINDS OF LEPIDOPTERA: TORTRICIDAE: CYDIA: CYDIA PACKARDI (ZELLER) AND CYDIA PRUNIVORA (WALSH)

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Kinds of wreckers that have generated secondary areas in the countries adjacent to Ukraine and continue to expand borders of dwelling are of serious threat. Danger to fruit crops of Ukraine is represented absent in Ukraine (List A-1) by quarantine kinds Cherry fruitworm (Cydia packardi Zeller) and Lesser appleworm (Cydia prunivora Walsh) a North American origin. Primary area Cherry fruitworm - east states of the USA where it damages fruit and decorative cultures of family Rosaceae. The modern area Cherry fruitworm covers on the most part of the North America. Primary area Lesser appleworm there are northeast states of the USA and adjoining areas of Canada. Today the worm is present at all east and western areas of the USA, and also in territory of 5 states of the east of Canada. Comparison of modern areas of these quarantine kinds has shown their full identity. By methods of climatic analogues and constructions climate gram it is shown, that climatic conditions of Ukraine correspond to climatic conditions of areas Cherry fruitworm and Lesser appleworm. Acclimatisation of these quarantine kinds in Ukraine is possible.
FACTORS OF ADVENTIVE SPECIES SPREADING IN SMALL RIVERS OF THE LOWER DNIEPER (UKRAINE)

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Spreading of alien animal species in ecosystems of Transdnipria in XX century is stipulated by several main factors, such as:

1. Changing of hydrological regime as a result of making a tandem reservoir system (1932–1962). At this stage ecological niches became vacant for lymnophylic fish, including the alien ones. However, hydraulic engineering didn’t lead up to fast spreading of adventive species in small rivers. For example, kilka Clupeonella cultriventris had developed the ecosystem of Transdnipria small rivers only by the end of 1950s (the first finding was dated to 1958).

2. Channel laying by means of that the filling of reservoirs in small rivers happens. Clupeonella cultriventris and Percarina demidoffi spread in these channels in the Dnipropetrovs’k area (Ukraine). These species began to be registered massively 40 years after building of the first channels.

3. Inflow of industrial effluents and municipal wastes, especially waters of mining industry into the water areas of the small rivers. From the second half of the 1960s the volumes of these discharges grew constantly. Development of agglomeration and agriculture resulted in the large-scale inflow of organic pollutants into the small rivers that influenced on massive development of zoo- and phytoplankton. At the end of the 1980s the abundance of C. cultriventris zooplanktophage in the Karachuny reservoir (the Ingulets) attained commercial amounts, its part in fishing-out made up to 20%.

4. Since the 1960s a considerable role in spreading of alien species has been played by directed and accidental introduction. As a result of accidental introduction Pseudorasbora parva got widespread. For the first time the species were registered in Dnipropetrovs’k region in 1989 in the Samara Dniprovska (a left-bank first-order tributary of the Dnipro). Currently these are widespread, functionally dangerous species in all rivers and isolated reservoirs of the region. Also many researchers associate massive spreading of Carassius auratus gibelio in the water areas of all small rivers in the region since the 1960s with the directed introduction.

5. Self-invasion of species. At present such species as Lepomis gibbosus explore the basin of the Mokra Sura (a right-bank first-order tributary of the Dnipro). First the species were registrated in the mouth of the river in 1996. Nowadays they spread along the stream of the Mokra Sura. Probability of accidental introduction of these species is great, but not proved. Typical self-invaders of the Dnipro are Stizostedion volgense, Mesogobius batrachocephalus and Atherina boyeri pontica, but they are registered only in the mouths of the Dnipro reservoir tributaries.

Thus a great danger for the balance of native fish complex of the small rivers of steppe Transdnipria is presented now by the only species of casual acclimatizers - P. parva Shleg., 1846. The middle level of threat is presented by C. auratus gibelio Bloch, 1782 and C. cultriventris Nord., 1840. The low level of threat is presented by Stizostedion volgensis Gmelin, 1788, Mesogobius batrachocephalus Pall., 1814 and Atherina boyeri pontica Eich., 1831.
SPATIAL AND TEMPORAL FISH SPECIES ASSOCIATIONS IN THE AREA INVADED BY SIX INVASIVE FISHES

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The study is dealing with the differences of the proportions within the years and biotopes. The model area was situated in the south-east part of Slovakia that is restricted to the lowlands. Five types of sampled sites were sampled within the study (rivers, oxbow lakes, pits, drainage canals and channels). Fishes were collected by using electrofishing covering all microhabitats. The sites were selected randomly within the whole study area during the years 2001-2007. Black bullhead (Ameiurus melas) and Amur sleeper (Perccottus glenii) brown bullhead (Ameiurus nebulosus), prussian carp (Carassius gibelio) pumpkinseed (Lepomis gibbosus) and topmouth gudgeon (Pseudorasbora parva) are distributed in the model area. Totally 224 samples were collected and 44 species were recorded.

Amur sleeper, Prussian carp and pumpkinseed were the most frequent species recorded within the study area. As to the another non-native species, black bullhead occurs still in high frequencies, but brown bullhead and topmouth gudgeon frequencies of occurrence were low. The graphical expression of the proportion of non-native species within the particular years and biotopes shows several trends and differences. Furthermore, several preferences or avoidances of biotope type were found for all species occurring in the sampled area. In the case of non-native species, only the significant avoidance of river biotope was found for black bullhead and Prussian carp and Amur sleeper.

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THE YEARLY VARIATIONS IN THE PORTION OF NATURAL DISTANT HYBRIDS OF BREAM ABRAMIS OF BRAMA (L.) AND ROACH RUTILUS OF RUTILUS (L.) IN RYBINSK RESERVOIR.

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The occurrence of hybrids in the reservoir can serve as one of the most important indices of reproduction conditions in fish population (Mayer, 1974; Mine, 1979). During their study in natural reservoir not only the special features of species multiplication, probably capable of the hybridization under the given conditions, but also the conditions at the moment of spawning (temperature and the water level) is necessary to be considered. The study of two spawning grounds (mouth of the river Shumarovka and Krasnyi Ruchei) with the low (2003) and high (2004, 2008 and 2009) water levels, with the wide fluctuations in temperature at the period of spawning (2004 and 2008) and the delay of the warming up to spawning temperatures (2003 and 2009) were carried out. On both spawning grounds the young hybrids were discovered only in 2003. In 2004 they were not discovered in any of investigated spawning grounds, in 2008- only in the region of Krasnyi Ruchei, and in 2009-only in the mouth of the river Shumarovka. According to the obtained data, the low level and the delay of the warming up of water on the spawning grounds at the moment of spawning a great bulk of bream and roach is multiplied in the overall sections of the reservoir. With the increased water level and the agreement of the periods of spawning the given sections are mainly used by roach and the appearance of young hybrids with the bream is single and has a fortuity nature.
INVASION OF ALIEN SPECIES IN HOLARTIC. BOROK – 3

ALIEN FISHES THE SOUTH OF THE WESTERN-SIBERIAN PLAIN INSTALLED IN RESERVOIRS IN XX BEGINNING OF XXI CENTURIES

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In 30 and with 50 for 80th years of last century in a course installation works in reservoirs of the south of West Siberian plain fishes from various zoogeographical provinces were installed. In total from remote regions in river basin reservoirs Ob 15 kinds of the fishes who were not meeting earlier in reservoirs West Siberian plain have been installed. 9 from them have acclimatised, among which only 3 were settled widely enough on Obsky pool. The others 6 kinds are presented by forms with the narrow temperature valency which distribution is limited isolated biotopes within reservoirs-coolers and deep-water reservoirs with constant low temperature of water in a deep part of a reservoir. Besides, in 80-90th years of the past and the beginning present centuries together with fish a material have been installed, and were widely settled on Obsky pool of 5 kinds alien fishes with short life cycle. Thus, in reservoirs of the south of West Siberian plain presented Ob-Irtysh the pool for today naturalized 14 kinds of alien fishes. Among them 8 it is possible to name invasives and 6 alien which distribution is limited isolated biotopes. Among invasives kinds of 75% make Ponto-Caspian invaders and only 25% kinds of reservoirs of East Asia. In turn alien kinds are presented by fishes from various zoogeographical provinces. In 20-30th years of last century in reservoirs of the Chelyabinsk, Sverdlovsk, Novosibirsk regions have been installed Coregonus albula, Osmerus eperlanus, Abramis brama, Cyprinus carpio. First two kinds for today are limited by installation reservoirs whereas the last were settled more widely. In 50-60th years of last century in reservoirs of the south of West Siberian plain have been installed Hypophthalmichthys molitrix, Ctenopharyngodon idella, Stizostedion lucioperca. First two kinds are reproduced only in reservoirs-coolers, and S. Lucioperca it was settled on all Obsky pool. In 80th years have been casually delivered and were widely settled Percottus glenii, Leucaspius delineatus, Alburnus alburnus, Pungitus platygaster. Also, have been installed and limited by reservoirs of installation Ictalurus punctatus and Stizostedion volgens. In the beginning of this century in riverheads Irtysh has been found out Pseudorasbora parva. Not got accustomed kinds basically are presented by group Salmoniformes: Salmo salar, Salvelinus lepechini, Salmo trutta, Salmo irideus, Oncorhynchus keta. Fish from East Asia – Channa argus which it was started in 80th years in reservoirs of Sverdlovsk region, also has not acclimatised. It is important to notice, that first five kinds which have not got accustomed in Obsky pool basically are presented by fishes from Arctic regions. As a whole alien fishes in reservoirs of the south of West Siberian plain are presented by more thermophilic forms. Among them fishes with the short life cycle, characterised by reusable adjournment of eggs during the reproduction period are most actively settled. On character of a food fishes-newcomers are equally presented eating bentos and a plankton. Predatory fishes make an insignificant share.
INVASIONS OF ALIEN PLANKTONIC ALGAE IN HOLARCTIC FRESHWATERS

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During last decades the expansion of non-indigenous species of different microscopic algae increased drastically. The review on distribution of some alien planktonic algae in freshwaters of Northern America and Europe is presented. Tropical species Cylindrospermopsis raciborskii (Wolosz.) Seenayya et Subba Raju (Cyanobacteria) has appeared in Europe in 1930s. In the late 1990s it has started to colonize actively the reservoirs in Greece, Hungary, France, the Netherlands and Germany, as well as many lakes and the rivers of Florida (USA). In the European freshwaters two additional neocyanobacterial species were revealed: Anabaena bergii Ostenfeld found in Lake Aral and the Caspian and Sphaerospermum aphanizomenoides (Forti) Zapomelova et al. comb. nov. (= Aphanizomenon aphanizomenoides Kom. et Horecka) found in Turkey and the Caspian. The species S. aphanizomenoides has been reported from Northern America too. For the first time Peridiniopsis kevei Grigor. et Vasas 2001 (= P. corillionii Leitao, Ten-Hage, Mascarell et Coute, 2001; P. rhomboides Krakhmalny, 2002) (Dinophyta) was revealed in Hungary (1986–1995). In the 1980s it was recorded in Italy, Germany, France, Romania, Austria, Slovakia, Croatia, Poland and Russia (Volga River). North-Western Atlantic Ocean species Actinocyclus normanii (Greg.) Hust. (Bacillariophyta) is known in the European water bodies since 1880s. However during the last decades it spread intensively into freshwaters in Russia, Netherlands, England, Finland, Germany, Slovakia, and Czech Republic. This species was also considered invasive in the Great Lakes and in the Parker River in Massachusetts (Northern America). Cosmopolitan, euryhaline diatom Skeletonema subsalsum (A. Cleve). Bethge is native species in the Baltic, Caspian seas and Sea of Azov. Since 1960s it spread into the Volga River (Russia) and in the Great Lakes (USA/Canada), and in 1980–1990s distributed in the rivers in Netherlands and Ireland lakes. The expansion of Gonyostomum semen (Ehr.) Diesing (Raphidophyta) from Northern to Western (France), Central (Hungary, Germany) and Eastern Europe (the Volga River basin, Russia) is expressed by occupying new habitats and mass development in several lakes and rivers. The increasing eutrophication due to human activity and global climate change are the main reasons for the expansion of non-indigenous algal species.
THE ROLE OF INVASIONS IN EVOLUTION OF COMMENSAL TAXA OF *MUS MUSCULUS* SENSU LATO SPECIES GROUP.

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The *Mus musculus* s.l. includes two divergent groups. The first one includes the aboriginal free-living species *M. spicilegus, M. macedonicus, M. spretus*. The second includes commensal taxa: *M. musculus, M. domesticus, M. castaneus*. One of most important evolutionary consequences of commensalisms and invasions is formation of hybrid zones of different kinds: a narrow 16-50 km wide zone of introgressive hybridisation between *M. musculus* and *M. domesticus* in Central Europe, a well-studied “tension zone” of secondary contact; large complex hybrid zone in Trans-Caucasus – presumably hybrid events can occur here at different times and were “superposed” on gene pool of ancient autochthonous population; large zones of gene introgression in Asia between *M. castaneus, M. domesticus* and various subspecies of *M. musculus*; hybridisation of different commensal taxa in large cities. Formation of these hybrid zones were consequence of invasions of commensal taxa of house mice and colonization of new territory by human agency. These zones are absolutely different in term of time and history of their formation and role of humans. It is possible to predict different ways of evolution in hybrid populations: (i) stabilization of hybrid genome, (ii) formation of premating reproductive isolation arise between parental taxa because of reinforcement and (iii) “dedifferentiation” of closely related taxa. The analysis of different kinds of hybridization supports the hypothesis of “dedifferentiation”. Supported by the RFBR grant 10-04-00214.
INVASION OF ALIEN SPECIES IN HOLARTIC. BOROK – 3

DISTRIBUTION AND SOME PARTICULARITIES OF STONE MOROKO *PSEUDORASBORA PARVA* (TEMMINCK ET SCHLEGEL, 1846) IN THE KREMENCHUK RESERVOIR.

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The Kremenchug reservoir forms up to 50% of total fish production of all Dnieper reservoirs, mainly at the account of native fishes. Therefore, this reservoir was selected for the study, because in the case of a negative effect, the damage caused to fish stocks will be the highest here due to the fact that stone moroko can sharply increase its number and negatively affect structural and functional indices of commercial fish stocks: it compete for food and eats away eggs and larvae of other fishes and can traumatize adult specimens (Movchan Y.V., Kozlov V.I., 1978; Naseka A.M. Daripasko O.A., 2005).

According to results of control catches with the aid of the fish juvenile drag net since the period of its first appearance in catches (in 1996), the mean long-term relative abundance of stone moroko in the Kremengug reservoir is moderate – 8.9 ind./100 m² (0.5% of total catch). But this species is distributed irregularly in different parts of the reservoir. The most abundant it is in the middle part of the reservoir (up to 18.8 ind./100 m² in some sampling sites). It is necessary to note that stone moroko is found only in lacustrine part of the reservoir (middle and lower parts). Absence of this species in the riverine part confirms literature data that water bodies with increased water exchange have unfavorable conditions for living and reproduction of this fish (Boltachev A.R., Danilyuk O.N., Pakhorukov N.P., Bondarev V.A., 2006, Karabanov D.P., Kodukhova Y.V., Slynko Y.V., 2009).

The peak of the stone moroko abundance in the reservoir was in 2002-2003. It is already over and this species probably retook its ecological niche and during last 5 years its abundance in the water body is relatively stable – about 5 ind./100 m². In our opinion, under the assumption of absence of sharp alterations of living conditions for native fish fauna, abundance of this species stabilized and it will remain on this level in the future.

The highest indices of length, weight, and condition factor of stone moroko are observed in the middle part of the Kremenchug reservoir, which is peculiar to other native cyprinids (bream, roach) (Kotovska H.O., 2009) and is explained by favorable conditions for fattening in this part of the reservoir.

Statistically significant exceeding of major marker biological indices of stone moroko in the Kremenchug reservoir in comparison with its native range indicates on very favorable conditions of living conditions of this species in the studied water body.
NATURALIZATION OF AMELANCHIER SPECIES FROM NORTH AMERICA IN THE SECONDARY DISTRIBUTION AREA

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The natural habitat of the species of Amelanchier Medik. is mainly located in North America. A. canadensis (L). Medik. was the first to be introduced to Europe back in the XVIIth century. And it became the forefather of new, steady and inclined to be naturalized species - A. spicata (Lam.) K. Koch and A. lamarckii F.-G. Schroeder. Later A. alnifolia (Nutt.). Nutt. Was brought to Europe.

In several regions of the Middle Russia A. spicata has become an invasive species, and in Bryansk region it has penetrated pine forests so deep that it has formed poor two-species cenosis without grass cover at all. Naturalization of A. alnifolia has been spotted in Perm, Leningrad, Moscow, Orlov and Tula regions.

A. confusa Hylander, relative to A. alnifolia, except for A. spicata and A. lamarckii, has also been naturalised in Europe (especially in Sweden). As far as species of Amelanchier, as many representatives of Rosaceae, are capable of self-fertilization and are inclined to apomixis, European neophites are likely to be formed as a result of induced apomixis through the pollen of closely related species.
INVASIVE AMPHIPODS AS TRANSFORMATION FACTOR OF LAKE LADOGA ECOSYSTEM

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Invasions of alien amphipods into aquatic ecosystems of the Gulf of Finland basin are of high concern and scientific interest as they may induce drastic ecological change. Lake Ladoga, the largest European lake, has still been steady enough to invasions of species which have already shown their high invasive potential. Until recently (2006 year) only one alien amphipod (namely Gmelinoides fasciatus (Stebbing, 1899)) has successfully naturalized in the lake. Moreover, G. fasciatus has in fact established as a dominant species in littoral benthic communities and has penetrated into Neva Bay of the eastern Gulf of Finland and Lake Onega.

The invasive amphipod Pontogammarus robustoides G.O. Sars, 1894 was first recorded in Lake Ladoga (the Volkhov Bay) in August 2006. The species was found associated with another alien amphipod, G. fasciatus, in a shallow littoral area of the Volkhov Bay. The biomass of the two amphipod species was 15% and 25.2%, respectively, of the total macrobenthos, with 0.86 and 1.46 g WW m$^{-2}$.

The invasive amphipod Chelicorophium curvispinum (G. O. Sars, 1895) was first recorded in Lake Ladoga in area of the Volkhov Bay in August 2009. The data on quantitative development of this species (1.6 g WW m$^{-2}$) and two other species of alien invasive amphipods (Baikalian G.fasciatus and Ponto-Caspian P.robustoides) (0.79 and 3.54 g WW m$^{-2}$) in the same biotope investigated in 2006 demonstrate that the role G.fasciatus has gone down, and value of P.robustoides has increased.

Despite of occurrence of new amphipod species in the lake G.fasciatus continues to play the leading role in the littoral habitats of the lake as C. curvispinum and P.robustoides seem to be absent for the present outside the Volkhov Bay by virtue of the certain reasons.

Study of feeding of G. fasciatus in Lake Ladoga has allowed to conclude that the Baikal invader has occupied substantially free ecological niche and uses trophic resources of the littoral zone which practically were inconsumable earlier, in particular, macrophytes and algae. According to the received estimations the ratio of food ration of G. fasciatus population and the annual production of macrophytes in various littoral habitats of the lake can vary from minimal to enough high values (over 20 %). This parameter averages about 10 %.

Transformation of littoral zone by this species has led to increase of abundance of littoral benthos due to development of the population of G. fasciatus without reduction of quantity of the rest benthos. One of a number of consequences of functioning of the population of this amphipod is the meliorative effect especially expressed in sandy habitats, in many of which the macrobenthos practically was absent before invasion of G. fasciatus. G. fasciatus has redistributed streams of substance and energy in the littoral zone. Invasion of G. fasciatus into Lake Ladoga has resulted in more high-grade use of the energy accumulated by producers and to transfer it to higher trophic levels.

As a result of recent invasions of new invasive amphipod species (C. curvispinum and P.robustoides), new serious transformations of the littoral zone communities of this largest European lake are possible.
DISTRIBUTION OF INVASIVE SPECIES IN THE BOTTOM CENOSES OF THE LITTORAL ZONE OF THE SARATOV RESERVOIR

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Specific hydrological features of the Caspian Sea and a number of other factors, which are associated with anthropogenic influence, have diverse effects on the process of species penetration – both up- and downstream – into the water bodies of the Volga basin, including reservoirs of the Lower Volga. The lack of up-to-date information on the spatial dynamics of invasive species in the deep-water zones of the Saratov Reservoir determined the aim of our study, which was to describe the species composition and to assess the distribution of invasive species in the Saratov Reservoir using the data of survey monitoring (June of 2006, 2009).

In the littoral zone of the reservoir (up to 3 m deep), the macro- and nekto-zoobentos has been found to contain 67 species and taxons, of which 25 are invasive. For the first time, we have registered expansion of crustaceans (Shablogammarus chablensis S.Cărăusu, 1943; Stenogammarus compressus G.O. Sars, 1894; Pseudocuma cercaroides G.O. Sars, 1894) and leeches (Archaebdella esmonti Grimm, 1876).

In the period of observation, the weighted-mean abundance of shallow-water macrozoobenthos amounted to 1905 individuals/m², 42.7% of which were invasive species. The mean biomass of soft benthos was 8.8 g/m², with the invasive species amounting to 88.6% of this value.

Of special interest are data on the distribution of various amphipods, representatives of the Ponto-Caspian complex. In the open shallow waters of the reservoir, their mass reaches 40% of the total benthos biomass. We have revealed 11 representatives of the saltish-water complex, with Chaetogammarus warpachowskyi and Dikerogammarus haemobaphes being widespread in the reservoir littoral zone (frequency of occurrence, 58 and 50% respectively) and local densities of psammophilous Stenogammarus dzjubani concentrating at a depth of 1 m.

Taking into account the high invasion activity of the Dreissena mollusks – in particular, Dreissena polymorpha and Dreissena bugensis, which is one of the youngest, in the evolutionary sense, species (Kovalyov, 2004) – we gave special attention to the spatial dynamics and occurrence of these species in various biotopes of the reservoir. We have found that in the joint colonies, Dreissena bugensis dominates – both in the number and mass – in all the reservoir regions and is most abundant in the deep-water zones (8-15 m deep). The biomass of Dreissena polymorpha has dropped by a factor of 1.5-3 as compared to the values registered in 1968-1971 (Volga and its life, 1978), which indicates spatial redistribution of mollusks-filterers and, probably, gradual replacement of Dreissena polymorpha by Dreissena bugensis.

We have also discovered that the gastropod Lithoglyphus naticoides, a representative of the Ponto-Azovian fauna, has become widespread all over the littoral zone of the reservoir (50% frequency), with its biomass reaching 41% of the total biomass of soft benthos.

If we take a more retrospective look at the benthic fauna of the Saratov Reservoir and compare it to the aboriginal fauna that existed before the Volga had become overregulated, we found that the amphipods Pontogammarus sarsi and Pontogammarus abbreviatus, as well as bivalves Anodonta stagnalis, Anodonta cygnea and some species of the superfamily Pisidioidea have disappeared and a few gastropod families (Lymnaeidae, Valvatidae, Planorbidae) have dropped in the number of species.

Thus, the decreased stability of the Volga reservoir ecosystem caused by the intensive multidirectional anthropogenic influence would lead, on the one hand, to further naturalization of the invasive species and, on the other hand, to the displacement of the aboriginal species. The consequences of these processes in the Saratov Reservoir are still to be estimated, and this requires further studies.
THE SPREAD OF SOME INTRODUCED FISH SPECIES IN TRANSCARPATIA (UKRAINE)

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Transcarpathia is very special region of Ukraine separated from the rest of territory by Carpathian Mountains. Its waters belong to the basin of the Danube. There are several endemic species of the Danube River Basin such as vairone *Telestes souffia*, danubian longbarbel gudgeon *Gobio uranoscopus*, huchen *Hucho hucho*. Recently, however, alien species of fish are spreading the territory that may negatively affect the native species. Our attention was attracted to the spreading the introduced species in Transcarpathia.

Data were collected in the plain part of Transcarpathian region, in Uzhhorod, Mukacheve, Beregovo and Irshava districts. The fish were caught with fishing rods and fish nets. The five introduced species were found: black bullhead *Ameiurus melas*, brown bullhead *A. nebulosus*, stone moroco *Pseudorasbora parva*, pumpkinseed *Lepomis gibbosus*, Chinese sleeper *Perccottus glenii*. Collections of these species for the Transcarpathia in the Zoological Museum are shown in the Zoological Museum NMNH of NAS of Ukraine (Catalogue of collections …, 2003) and published data were also reviewed.

In data published on modern species of fish populations of the Tisza River within the boundaries of Ukraine and its basin (Movchan, 2000) are shown the same three introduced species we also found: *Ameiurus nebulosus, Pseudorasbora parva, Perccottus glenii*. But species were submitted without detailing theirs locations.

According to published data, stone moroco *Pseudorasbora parva*, in the Transcarpathian region was determined in Beregovo district, near Nove Selo in the former riverbed of the River Latoritca in 1999 (Catalogue of collections …, 2003). We found this species in all four Transcarpathian districts studied, in small lakes and ponds in the basins of rivers Uzh and Latoritca as well as in downstream of River Borzhava.

In the zoological museum there are many collections of brown bullhead *Ameiurus nebulosus* from Transcarpathia mostly from Uzhgorod district, there are also the samples from Mukacheve, Perechin and Vynohradiv districts. Almost all of these samples were collected in the 70th years of XX century, so our data confirm the success spreading of this species in the region. Brown bullhead was firstly introduced in 1954, since 80-s and up to now this fish widely distributed in suitable habitats (a small reservoirs, former riverbeds, ponds). We have discovered two species of this genus in the lake Chorne in Uzhgorod – *A. melas* and *A. nebulosus* as were defined by P.Maithland (2000). Because the data of our preliminary studies which did not specify the species, we refer them to genus *Ameiurus sp*. These fish occurred in Uzhhorod, Beregovo and Mukacheve districts (lakes, ponds, and in the former riverbed in the basins of rivers Latorytsa, Uzh, Borzhava).

Pumpkinseed *Lepomis gibbosus* is presented in Transcarpathia’s collections of the Zoological Museum for 1999 near Batrad village of Beregovo district (Catalogue of collections …, 2003). We determined the species occurs in all four districts studied in lakes, ponds and channels of Latorytsa and Uzh basins. The sample from Irshava district, village Gorbok was granted by Y.E. Zizda. For the Tisza basin Movchan (2000) indicated the presence of another species of this genus – *Lepomis macrochirus*, but in a later paper the same author (Movchan, 2008-2009) did not noticed of this species for the fauna of Ukraine, instead mentioned the *L. gibbosus*. In any case, our studies determined this last, since all fish have red spot at posterior edge of opercular flap, as well as other character symptoms of the *L. gibbosus* (Scott, Crossman, 1973).

Chinese sleeper *Perccottus glenii* was found in three points of Uzhgorod district - in the lakes around Uzhhorod and former riverbed of Latorytsa near village Mala Dobron. Collections of the Zoological Museum also these samples from the Chop and village Batrad of Beregovo district.
ALIEN SPECIES IN THE FAUNA OF TAMBOV PROVINCE

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Sixty two alien species of animals are registered in the Tambov Province. We distinguish two groups of them on way of spread into the new territories.

1. Originally spread species. They in ones turn may distinguish two subgroups.

1a. Established species. Such species formed stable groups of breeding specimens. There are wasp spider (Argiope bruennichi), great white heron (Egretta alba), white stork (Ciconia ciconia), herring gull (Larus argentatus), whiskered tern (Chlidonias hybridus), rock dove (Columba livia), collared dove (Streptopelia decaocto), yellow-headed wagtail (Motacilla lutea), black redstart (Phoenicurus ochruros), paddly-field warbler (Acrocephalus agricola), bearded tit (Panurus biarmicus), and beech (Martes foina).

1b. Irregularly registered species, whose perspectives for the present are indeterminate. Some of them may to form groups and even to breed in separate years. This subgroup include next species: Zebra mussel (Dreissena polymorpha), lobed argiope (Argiope lobata), dark rockbrown (Satyrus anthe), death's head hawkmoth (Acherontia atropos), European white pelican (Pelecanus onocrotalus), great cormorant (Phalacrocorax carbo), little egret (Egretta garzetta), black-crowned night-heron (Nycticorax nycticorax), greater flamingo (Phoenicopterus roseus), shelduck (Taborna taborna), roody shelduck (T. ferruginea), white-headed duck (Oxyura leucocephala), griffon vulture (Gyps fulvus), willow grouse (Lagopus lagopus), demoiselle crane (Anthropoides virgo), black-winged pratincole (Glareola nordmanni), black-winged stilt (Himantopus himantopus), pied avocet (Recurvirostra avosetta), great black-headed gull (Larus hyperboreus), Lapland owl (Strix nebulosa), short-toed lark (Calandrella cinerea), black lark (Melanocorypha yeltoniensis), white-winged lark (M. leucoptera), calandra lark (M. calandra), pipit (Anthus cervinus), black-headed bunting (Emberiza melanocephala), corn bunting (E. rustica), cirl bunting (E. cirlus), rose-colored starling (Sturnus roseus), and Kuhl’s pipistrelle (Pipistrellus kuhlii).

2. Introduced species. They may distinguish two subgroups too.

2a. Intentionally introduced species. There are eastern European snail (Cepaea vindobonensis), bighed (Arísthchthys nobilis), grass carp (Ctenopharyngodon idella), silver carp (Hypophthalmichthys molitrix), Amur sleeper (Percottus gleni), ring-necked pheasant (Phasianus colchicus), muskrat (Ondatra zibethicus), raccoon dog (Nyctereutes procyonoides), American mink (Mustela vison), and sika deer (Cervus nippon).

2b. Accidentally introduced species. There are house centipede (Scutigera coleoptrata), German cockroach (Blattella germanica), oriental cockroach (Blatta orientalis), Colorado potato beetle (Leptinotarsa decemlineata), Norway rat (Rattus norvegicus), and roof rat (Rattus rattus).

Used classification of alien species undoubtedly is far from perfection, because some species may be related to several groups.

We not consider the reintroduced species, but sometimes the loss of genofond of populations of aboriginal species was preceding to reintroduction.

Ways and methods of spread of alien species into the Tambov Province territory, their current state, character of influence on native ecosystems and aboriginal species, and their perspectives are discussed.
ROLE OF DIATOM ALGAE *ACTINOCYCLUS NORMANII* (GREG.) HUST. IN PHYTOPLANKTON STRUCTURE OF THE CURONIAN LAGOON

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In the Baltic region for the first time invasive euryhaline diatom species *Actinocyclus normanii* and its morphotype subsalsa were founded in Berlin water basins in 1911, where algal studies have been conducted since 1825. The appearance of this species in some European rivers is well dated. In river Spree and Havel it was found since the late 1970s and early 1980s accordingly. Nowadays *A. normanii* is widespread in modern eutrophicated European rivers (e.g. Danube, Main, Rhine), as well as the abundant in brackish waters of the Baltic Sea (e.g. Szczecin Lagoon) and of other coastal areas including Northern Atlantic (Witkowski et al., 2005; Geissler et al., 2006). Expansion of the habitat of *A. normanii* has been observed in the Volga basin, where it appeared as an invader in 1986 after new transgression of the Caspian Sea that started in 1978. This species is currently naturalized in Volga reservoirs (Korneva, 2007).

The first discovery of *A. normanii* f. subsalsa in the Curonian Lagoon date back to 1920–1930s and those of *A. normanii* together with the form subsalsa – to 1980–1995 (Olenina, 1996). In the list of dominating species of the Lagoon phytoplankton in 1920–1930s, 1951–1957, 1974–1975, and 1980–1996 this species was not registered (Vaikutienė, 2002). At the same time in 1998 the superficial bottom sediments were predominated by *A. normanii* (up to 50% in some samples). The greater abundance of it was registered in the Panerija Depression (the northern part of the lagoon), where the inflows of marine water get through Klaipėda Strait. Thereby part of population of this species might have been transported from the sea (Kasperovinienė, Vaikutienė, 2007). The aim of our study was to assess the current state of the phytoplankton of the Curonian Lagoon, in particular, to determine the role of *Actinocyclus normanii* in the structure of the dominant complex and its spatial distribution through the lagoon. In June-August 2001 and 2005–2009 at 20 stations in the Russian part of the Curonian Lagoon 39 samples were collected, 13 of which at four stations in the littoral zone at depth of 0.5–1 m, situated along the eastern part of the Curonian Spit and others from the open part of the lagoon. Sampling and further analysis methods were performed according to guidelines of HELCOM (1988).

In August 2001 all the Russian part of the Curonian Lagoon was studied. Large algae *Actinocyclus normanii* became dominant reaching 21–27% of total biomass only at two stations, which situated in the southern and eastern part of water body. The greater vegetation was registered in the south – 450·10³ unit·l⁻¹ and 3.67 g·m⁻³.

In July 2005 abundance of this diatom species was higher at all three stations and its relative biomass composed 54–77%. The maximum number and biomass *A. normanii* were noted in the eastern part of the lagoon – 1900·10³ unit·l⁻¹ and 33.97 g·m⁻³ correspondingly (Lange, 2007). The distribution of species on the lagoon area was uneven in June 2006; *A. normanii* did not met in the southwestern coastal and northeastern areas. Diatom dominated by only at two stations. In general, its abundance reached 160·10³ unit·l⁻¹ and biomass – 1.38 g·m⁻³. The only exception was the western part, where the greatest number of *A. normanii* (1500 unit·l⁻¹) and biomass 23.74 g·m⁻³ (52% of the total biomass) were. In July 2007 noted the relatively even distribution of *Actinocyclus*, which prevailed in 80% of the stations, forming 15–49% of the total biomass. The number of this diatom reached 640·10³ unit·l⁻¹, biomass – 6.78 g·m⁻³. The maximum recorded in the western part of the lagoon.
SUCCESSFUL ESTABLISHMENT OF DREISSENIDS IN THE UCHA RESERVOIR AND IN THE MOSCOW RIVER

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*Dreissena polymorpha* (Pall.) was the only Dreissenidae species found in the Volga River until 1992 (Starobogatov, Andreeva, 1994). *Dreissena bugensis* (Andr.) was first reported in the Volga in 1992 (Orlova et al., 2003).

The Moscow Canal between the Volga and the Moscow-River was built in 1937. It made possible the penetration of Dreissenids existed in periphyton of boats traveling from the Volga into the Moscow-River.

*D. polymorpha* was found for the first time in the benthos of the unnavigable Ucha Reservoir with drinking water (Moscow region) in 1945 and in 1951 it dominated in benthos communities (Sokolova, 1959). Zebra mussel uses various hard substrates at the bottom (depth 1,5 – 7 m). The maximum abundance and biomass of *D. polymorpha* was 1633 g/m² and 2115 ind/m² in 1977 (Lvova, 1980).

*D. polymorpha* was found for the first time in the Moscow-River on the territory of Moscow in 1987 in flood-plain Strogino, the maximum abundance and biomass was 36000 ind/m² and 20000 g/m² (Paliy et al., 1992). In 1993 *D. polymorpha* was ranged on all kinds of hard substrates in the area of the Moscow-River between Rubliovo and Fili (Lvova et all., 1996).

*D. bugensis* was found for the first time in the benthos of the Ucha Reservoir in August 2002. The age of the mollusks was 2+, and their maximum shell length was 28 mm (Lvova, 2002). It is the suggested that the plankton larvae penetrated the Ucha reservoir in 2000 with the water flow from the Pestovo Reservoir.

In October 2003 *D. bugensis* was found for the first time in Strogino flood-plain in littoral zone (depth 1 – 2,5m) on the shells of Unionidae in all mixed druses, comprising only 12% of both Dreissenidae species. Maximum shell length was 24 mm, the age was no more then 2+. Therefore, these mollusks appeared first in the Moscow-River in 2001 (Lvova, 2004). In October 2004 *D. bugensis* became the dominant species in the same river area in all mixed settlements, comprising 71% of the total number; in October 2005 – 66%. The maximum shell length was 33 mm. The mean amount of Dreissenid was 6700 ind/m² (52 % with shell length no more than 11 mm), biomass – 1172 g/m². At the depth (4-6 m) *D. bugensis* dominated completely (94%); mean amount - 9875 ind/m²; biomass – 14633 g/m². During the consequent years *D. polymorpha* practically disappeared at the depth (3 % in 2006; 4 % in 2007).

Thus, the “new invader” - *D. bugensis* forced out the “aborigine” *D. polymorpha* in settlements with high density. Probably it is connected with the known features of oxygen consumption (Morozova, 1980; Shkorbatov et al, 1994) and with other ecological characteristics of these Dreissenids.
NATURALIZATION OF ADVENTIVE PLANTS IN MAGADAN REGION

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During field season of 2004-2009 we studied adventive flora of Magadan region. According to the obtained data we made a checklist of the adventive plants of Magadan region with indication of naturalization degree for each species. The list consisting of 292 species includes also those species which were found just once in the region.

Adventive flora of the region consists of unintentionally introduces species (xenophytes) and species which were brought to the region intently as seed grain or food and medicinal herbs, growing or remaining on anthropogenic ecotopes without human intention (ergasiophygophytes). Species which were brought to the region by mixed types of introduction are considered to be xeno-ergasiophygophytes.

A special group of adventive plants consisting of 22 species are pseudoaboriginals. These are species with the natural habitat bordering on the floristic region of the analyzed territory, but being in conditions of anthropogenic transformation they extend their habitat over the explored territory using anthropogenic ecotopes. However, considerable amount of such species were introduced not from the neighboring floristic areas within Magadan region considering their rare occurrence here, but from other regions.

Quantitative ratio of species according to introducing type and degree of naturalization is presented in Table 1.

Table 1. The groups of adventive species by type of introduction and naturalization degree

<table>
<thead>
<tr>
<th></th>
<th>Ephemeralophytes</th>
<th>Colonophytes</th>
<th>Poecophytes</th>
<th>Agriophytes</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ergasiophygophytes</td>
<td>32 (0)</td>
<td>26 (1)</td>
<td>12 (2)</td>
<td>6 (0)</td>
<td>76 (3)</td>
</tr>
<tr>
<td>Xenophytes</td>
<td>31 (0)</td>
<td>84 (6)</td>
<td>55 (9)</td>
<td>40 (4)</td>
<td>210 (19)</td>
</tr>
<tr>
<td>Xeno-ergasiophygophytes</td>
<td>1</td>
<td>3</td>
<td>1</td>
<td>1</td>
<td>6</td>
</tr>
<tr>
<td>Total (including pseudoaboriginals)</td>
<td>64</td>
<td>113</td>
<td>68</td>
<td>47</td>
<td>292 (22)</td>
</tr>
</tbody>
</table>

According to Table 1, the species unintentionally introduced into the region have greater potential of naturalization. Content of colonophytes is approximately equal among all naturalization groups including pseudoaboriginals by type of introduction and varies within 30-40%. In general pseudoaboriginals-xenophytes spread to natural ecotopes as frequently as xenophytes, however they more frequently naturalize on anthropogenic ecotopes. On the whole 16% of adventive species spread to natural ecotopes. However, there is no species replacing aboriginal species in natural ecotopes among 47 agriophytes typical for Magadan region.
Since 1992, most juvenile Atlantic salmon *Salmo salar* from the Keret' River (White Sea basin) have been infected with the dangerous parasite *G. salaris* almost every year. Decreasing the population size, *G. salaris* affected salmon gene pool. Wild juveniles from the Keret', in contrast to juveniles from other rivers, were found to have a higher fluctuating asymmetry of scull bones in comparison with cultivated juveniles. Hybrids between the Atlantic salmon and brown trout (*S. trutta*) were found in the river. Based on analysis of the patterns of allozyme marker distribution, one may conclude that there were rapids where only one pair of Atlantic salmon spawned in some years. Because of the small size of the spawning stock, samples of juveniles collected in different years at the same rapids sometimes considerably differed from one another in the frequencies of protein marker alleles. At the same time, we found decrease age of catadromous migration and increase in frequency of one haplotype of mitochondrial DNA. These responses likely have adaptive character.

This study was supported by the program of the Russian Academy of Sciences “Biological Diversity” (subprogram "Gene Pools and Genetic Diversity").
PHYLOGENETIC INTERRELATIONSHIPS OF THREE INTRODUCED POPULATIONS OF *Gmelinoides fasciatus* (Stebbing, 1899) (Crustacea: Amphipoda) INFERRED FROM MOLECULAR DATA

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Anthropogenic introduction (intentional or not) implies the transfer of living creatures beyond their natural range. Introduced population is therefore initially isolated from the source population supposing independent microevolutionary processes. These processes could be sufficiently accelerated by the so called “founder effect” or the “bottleneck effect” thanks to the reduction of heterozygosity rate and the changing of allele frequencies. As a result the human-caused introductions could serve as a model for natural dispersing and related evolutionary events. The paper presents the results of phylogenetic interrelationships analysis of three introduced populations of *Gmelinoides fasciatus* (Stebbing, 1899), an amphipod of Lake Baikal origin, based on individual sequences of the mitochondrial cytochrome c oxidase subunit one gene fragment. These results are consistent with literature data on the source for North-Western Russia introductions and allow to confirm the suggestion about the origin of the Ivano-Arakhley Lakes population. No significant differences between the introduced and the parent populations were found. The level of genetic diversity in the introduced populations was found significantly lower than that in the source Baikalian population. Specific haplotypes were also absent. This all gives evidence that genetic isolation of the introduced child populations has not yet been existed and their interrelationships with parent population could be described by the “Single stepping stone range expansion” model.
THE TRENDS OF BIOLOGICAL INVASIONS IN ZOOPLANKTON OF THE VOLGOGRAD RESERVOIR

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Development of the net of interbasin canals gave water organisms new opportunities for widening their ranges. As far as ecological systems of reservoirs have high biological potential and diversity of ecological niches, many invaders have successfully acclimatized and have become an inalienable part of the habitats of given water basins.

The change in fauna of the Volgograd Reservoir was estimated on the basis of the literature sources (beginning with 1900) and the period of observation 1999-2009.

Analysis which was carried out revealed changes in species composition which had taken place in zooplankton habitats within the last 110 years. In the early period of the appearance of the Reservoir the number of species of zooplankton has increased from 48-55 (in the river) (Suschkina, 1940; Konstantinova, 1960) up to 68-76 (Viuschkova, 1965). The increase occurred because of introduction of the new elements of fauna from flood-lands covered with water.


Since 2000 in the Reservoir 7 new species were registered: *Cornigerius maeoticus maeoticus* (Pengo, 1879), *Halicyclops sarsi* (Akatova, 1935), *Heterocope appendiculata* (Sars, 1863), *Heterocope caspia* (Sars, 1897), *Cercopagis pengoi* (Ostroumov, 1892), *Podonevdadna trigona ovum* (Zernov, 1901), *Cornigerius bicornis* (Zernov, 1901).

Typical representative of the Caspian fauna - *Halicyclops sarsi*, from the family of Cyclopidae – the most widespread species in the Caspian Sea is met in all regions and is especially numerous in the Northern Caspian Sea. It was first registered in the reservoirs of the Lower Volga in 2002. It occurs in the upper and the middle zones of the Volgograd Reservoir. It is one of the "southern invaders". *Heterocope caspia* – is a representative of the Ponto-Caspian basin. It occurs mainly in the littoral zone. In winter it is observed in all the shallow water regions and because of its large size shapes the basis of the biomass of zooplankton. Another representative of this kind is *Heterocope appendiculata* – a typical representative of large lakes in the North-West. Being a characteristic form of deep water plankton in the Reservoir it occurs in the sections with lowered velocity of current. In the Volgograd Reservoir it is noticed in summer zooplankton in the littoral zones everywhere.

*Cornigerius m. maeoticus* - Cladocera, habitant of the pelagic of the desalinated parts of the southern seas (the Azov, the Caspian), in plankton of rivers of the Azov-Black Sea basin, the Black Sea estuaries (Mordukhai-Boltovskoi, Rivier, 1986).

Publications of the first occasional occurrence of *Cornigerius m. maeoticus* in the middle section of the Volgograd Reservoir, in the mouth of river Erouslian date to 1971 (Viuschkova, 1971). It is possible that this species was introduced into the Volgograd Reservoir in the process of the intentional stocking (Polychaeta and Mysidaceae were taken from the deltas of rivers Don and Volga). It appeared in the whole area of the Volgograd Reservoir by 2000 (Zotova, Malinina, 2005). It reaches mass development in the reservoir in July. Possible route of introduction: from the Caspian Sea.
Cladocera of *Cercopagis pengoi* – representative of the Ponto-Caspian-Azov fauna (Mordukhai-Boltovskoi, Rivier, 1986; Grigorovich et al., 2000). It is a habitant of the open part of the sea, including its desalinated part (Manuilova, 1964). It was first noticed in the Volgograd Reservoir in 2002. The species was noticed in the middle and the lower sections. In mass it occurs in July-August. It is a fodder object. It invaded the reservoir from the Northern Caspian Sea.

In 2007 in the lower zone of the Volgograd Reservoir in mass was registered *Podonevadna trigona ovum*. In June 2008-2009 in the same sections was noticed *Cornigerius bicornis* in large quantities at the same time as the species mentioned above. Caspian Polyphemoidea are intensively developing and actively spreading group. Unlike the ocean Podonidae, morphologically and ecologically relatively stable, Caspian forms are extremely ecologically changeable and having the opportunity of dissemination in the Volgograd Reservoir in the present time they form numerous populations.

The difference in the composition of species of the dominating forms between the initial and the present stages of the existence of the reservoir is about 45 %.
MODERN DIVERSITY OF ALIEN FISHES IN THE TCHU AND TALAS RIVER WATERSHEDS

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Some merchantable fish species like sander *Sander lucioperca*, bream *Abramis brama*, grass carp *Ctenopharyngodon idella*, silver carp *Hypophthalmichthys molitrix*, Amur snakehead *Channa argus* had been transferred in the Tchu and Talas river systems at the second part of XX-th century. With that occasion some non-commercial fishes penetrated here at the same times (Dukravets, Mitrofanov V.P., 1992). This communication devoted to the situation in those areas in 2007-2009.

Nowadays water of the both river systems is used generally for irrigation so in the bigger part of area water regimen is not suitable enough for long-living indigenous fishes. Alien species like stone morocos *Pseudorasbora parva*, Amur false gudgeon *Abbottina rivularis*, common sawbelly *Hemiculter leucisculus*, beautiful sleeper *Micropercops (Hypseleotris) cintus* and Amur goby *Rhinogobius sp.* wide spread in lakes, ponds and tributaries of general rivers. There are some water bodies where each of alien species like common sawbelly, stone morocos, mosquito fish *Gambusia holdbrookii*, Amur snakehead is dominating in fish communities. Alien fishes had been found in some small absolutely isolated lakes in desert.

Areas of some other alien fishes like Balkhash perch *Perca schrenkii* and tench *Tinca tinca* had been significantly shortened for the last years. In the Tchu and Talas river watersheds has not been found bitterlings *Rhodeus* and ricefish *Oryzias latipes* rather wide spread in the adjoining Ili and Syrdarya river watersheds.
LINE OF OIL-TRUNK PIPELINES AS NEW MIGRATION WAYS

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Nowadays the development and the prosperity of the Far eastern federal region are closely related with extractive branches of economic to a considerable degree and depends on using of natural resources, first of all of oil and natural gas. At the same time the technological processes which are used for production and transportation of carbohydrates are not the most modern and effective. As result the production of the oil and the natural gas hurts certain damage to natural complexes of the region.

At present time there are a lot of reports about a direct damage of natural fauna which appears as destruction of animals and its habitats but very few attentions are devoted to indirect damage. However the last one may be even more considerable.

The point is that the oil- and gas-trunk pipelines are laid through woodlands for a considerable extension and many of these are primeval forest and are saved to our time in their primitive appearance. A dissection of a woodland by a cutting results to beginning of “edge of a forest” effect. After a local increase of a species diversity level edge of forest begins to act in a way of ecological passage and the migration way.

As result of the dissection of the woodland by the glade happens an increase of quantity of synanthropic species like insects, birds and mammals first of all like cockroaches, lice, flies and flea from insects, sparrows, black and large-billed crows, as well appearance of rats, mouse, stray dogs and cats. In this connection a burden of preying from these species first of all on colony-forming, natatorial and rare birds, insectivorous and chiropters increases, a loss of egg layings and nestlings of birds which nest on the ground increases too.

A non-observance of rules of utilizations of food waste and of behavior when meeting of wild animals first of all foxes results to beginning an effect of domestication of last. As result risk of beginning zoonotic diseases and quantity of these ecologically flexible species increases.

During a building and/or reconstruction of roads and branch lines on stage of construction of gas/oil pipelines as well on stage of using an availability of habitats of commercial and rare animal and bird species increases.

All of these circumstances results to extending of affected zone of use gas/oil pipelines even in normal mode as it have been showed in practice to 1,0-1,5 km.
PHYTOPHILIC COMMUNITIES IN INVASIVE MACROPHYTE ELODEA CANADENSIS MICHX. AND NATIVE SPECIES CHARA SP. IN THE KARASINOE LAKE (LAKE BAIKAL BASIN)

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The structure of phytophilic communities and quantitative characteristics of macroinvertebrates in the invasive macrophyte Elodea canadensis and native species Chara sp. inhabited the Karasinoe Lake (the Lake Baikal basin) were studied. E. canadensis is the second species of macrophyte in the lake following by the Chara on its spatial distribution and abundance, but it covers no more than 3% of the lake floor. To date it has reached the maximum of its expansion.

Larvae of chironomids, dragonflies, mayflies and caddishlies are the main organisms in Elodea that is similar to the Chara and the joint communities of these species. Values of total biomass in Elodea varied from 4,4 g/m$^2$ to 15,24 g/m$^2$ (N=7), while in Chara – from 14,1g/m$^2$ to 35,4 g/m$^2$ (N=3), and in joint roots of these species – from 15,4 g/m$^2$ to 17,3 g/m$^2$ (N=2). Biomass is strong depended on the presence of heavy larvae of chironomids (Rs=0,74, p=0,006, N=12) and dragonflies (Rs=0,69, p=0,014, N=12). The silt sediments are less inhabited by the organisms (1,0–3,5g/m$^2$, N=3).

The main conclusions of our study are:
1. The invasive macrophyte E. canadensis are able to modify the aquatic environment by making habitats suitable for phytophilic organisms;
2. The ecological impact of E. canadensis naturalization on the native communities is the lowest in the lakes with Chara as predominant species;

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The polychaetes of genus *Marenzelleria* are the most successful alien benthic species in the Baltic Sea during recent decades. They appeared firstly in 1985 and colonized quickly the entire Baltic Sea. In the Russian waters of the eastern Gulf of Finland *Marenzelleria* were known from 1996. In succeeding years these polychaetes (identified as *Marenzelleria neglecta*) became a common (in some localities dominant) component of a bottom macrofauna. However up to 2009 *Marenzelleria* introduction did not cause the pronounced changes of native benthic communities in the study area. Dense populations of polychaetes inhabited mainly shallow bottoms (depth less than 30 m) and did not penetrate in bellow-termocline waters. Apparently, the development of polychaetes in deep-water areas was hindered by episodic bottom hypoxia and anoxia which become rather usual phenomenon in the eastern Gulf of Finland in the last decades. The hypoxic events leaded to the mass mortality of benthic organisms and formation of extensive life-less or strongly impoverished bottom areas. By 2009 *Marenzelleria* colonized these areas and occupied the all bottom of the Gulf. Now it is the most spread and abundant macrobenthic taxon in the eastern Gulf of Finland. At some sites all macrofauna consists of *Marenzelleria* only. The reasons of *Marenzelleria* penetration to the deep-water habitats in 2009 are not clear. It is possible that we have “second wave” of invasion connected with introduction of new for the study area *Marenzelleria arctica*. Recently, the occurrence of three sibling morphologically almost indistinguishable species *Marenzelleria* species in the Baltic Sea was confirmed by molecular methods (Blank et al., 2008). *Marenzelleria spp.* success in 2009, at least partly, also can be connected with good survival of planktonic larvae because of favorable changes in pelagic communities, since very high biomass of zooplankton was recorded in this year. Polychaetes *Marenzelleria spp.* have capacity for quickly colonization of vacant bottom areas during improvement of oxygen conditions because of existence planktonic larvae and tolerance to low oxygen level of adult worms. Thus, large-scale invasion by *Marenzelleria spp.* radically changed the recovery successional processes after hypoxic events and it has great potential to alter ecosystem-level properties in the eastern Gulf of Finland.
PHYTOPLANKTON IN SHIPS’ BALLAST WATER IN THE PORT OF VLADIVOSTOK

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A supposition on distribution of marine organisms with vessels’ ballast waters was first made in the 1900s, but the most serious attention has been paid to this problem only since the 1970s. Nowadays, transferring marine organisms with ship ballast waters is one of the most significant vectors of anthropogenic invasion.

Despite the plankton monitoring in Peter the Great Bay has been conducted since 1978, over 30 new microalgae species, never detected before in Russian waters of the Sea of Japan, have been found in the plankton of the bay for the recent 20 years. One of the causes of the broadening phytoplankton diversity could be introduction of microalgae species with ships’ ballast waters.

The purpose of this study is evaluation of the plankton flora in ballast waters of ships arriving at the port of Vladivostok from the Yellow Sea.

The material of the study included 23 net samples and 37 bathometric samples, collected since October 2007 through December 2009 in the ballast water of the “Minotaur” tanker, which came from the ports of Longkou and Laizhou, Yellow sea (China), for shipment at the port of Vladivostok (Peter the Great Bay, Sea of Japan). The bathometric samples were collected both from the surface and near-bottom horizons. The material was fixed with Utermöhl’s solution and concentrated through the sedimentation method. Number of cells was counted in a one-milliliter Sedgewick-Rafter counting cell.

In total, 157 species of microalgae belonging to 6 divisions were found for the period of studies: Bacillariophyta (95 species), Dinophyta (55), Chrysophyta (3), Euglenophyta (2), Cryptophyta and Chlorophyta (1 species from each). Number of phytoplankton species in samples varied from 7 to 45. The largest number of phytoplankton species was recorded in March, and the minimum one – in January. 96% of the species in floristic composition of the ballast waters were the same as those in Russian waters of the Sea of Japan. Five new algal species were found in Peter the Great Bay – diatoms Cyclotella litoralis, Eucampia zodiacus f. cylindrocornis, Lioloma pacificum, Stephanopyxis palmeriana and the dinoflagellate Prorocentrum rhathymum. The overall phytoplankton density in the surface horizon of the ballast waters varied from 104 to 213,318 cells/l. We found ten species that are known as potentially toxic microalgae – diatoms Pseudo-nitzschia calliantha, P. delicatissima, P. multistriata, P. pungens and dinophytes Alexandrium tamarense, Dinophysis acuminata, D. rotundata, Karenia mikimotoi, Prorocentrum minimum, P. rhathymum and Protoceratium reticulatum. Except for P. rhathymum, all the species are spread in coastal waters of the Northwestern Sea of Japan. Species like Pseudo-nitzschia spp. and P. minimum are known to cause water bloom in summer and fall season. The conducted study is preliminary. However, based on the obtained data, we can make a conclusion concerning a probability of transporting potentially toxic and alien species with ballast waters from the Yellow Sea.

This research was partly supported by the grants FEB RAS (№ 09-І-І23-12, № 09-І-І23-01, № 09-І-І15-03), and FCP “World Ocean” № 01.420.1.2.0003.
BIOTIC INVASIONS OF INSECTS AND GEOGRAPHY OF FITOSANITARY SITUATIONS IN RUSSIA

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Geography of fitosanitary problems is, first of all, definition of "gate" invasion and revealing potential taxon-invaders.

1. Two basic are most dangerous to territory of Russia invasive a stream: east (from the Asian region) and western (from America). Insects Homoptera are most often brought: Coccinea, Aphidinea, Aleyrodinea (more than 65 %). More often they are transferred with a planting material.

2. The most part of plants is imported to Europe as a planting material and vegetables from tropical and subtropical zones. In opened locality on the territory of Russia the substantiation of the insects-phytophages connected with them is improbable.

3. In territory European Russia 152 invasive species insects-phytophages are revealed. Last years intensity strengthening invasions (to 18 invasions of insects-phytophages in a year) is observed.

4. The greatest threat biotic invasion bear for island and local natural and agricultural ecosystems. Character and an orientation of moving of a invasive species is defined by its biological features and permeability of territory of moving.

5. During fitosanitary-geographical differentiation of European and Asian parts of Russia areas are selected: northern, central, northern Povolgie, forest-steppe, steppe, west-Siberian, east-Siberian, maritime.

6. Symmetry in indicators high invasive loadings (5-11 species) is observed for a Far East zone (Primorski Territory, the south of Khabarovsk territory, the Amur region) and steppe (North Caucasian region).

Researches are executed with support of the program of Presidium of the Russian Academy of Sciences «Biodiversity» («Biodiversity: inventory, functions, preservation») and the RFFR (№ 09-05-01010).
ASSESSING THE RISKS OF AQUATIC INVERTEBRATES INVASIONS IN THE SHATT AL-ARAB REGION

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Shatt Al-Arab Region is an important invasion gateway in West Asia. Protocols of the ALARM project were used for estimation of aquatic invasions’ risk assessment. There are five global alien species with high (*Eriocheir sinensis, Macrobrachium nipponense, Palaemon elegans, Balanus amphitrite, Potamopyrgus antipodarum*) invasiveness are widespread among the region. Identification and analysis of invasions’ pathways within the region show predominantly secondary nature spread of aliens and also importance of shipping and canals for recent aliens’ expansion. Five assessment units (Hareer Region, Abu Al-Khaseeb, Al-Sindibad, Qurna, and Garmat Ali) have extremely high and one (Shatt Al-Basrah) – high biological contamination and risk of biological pollution. Alien species increase similarity of macrobenthic communities (biotic homogenization). Among key drivers of biological invasions in this region special place occupy geopolitic conflicteness and struggle for natural resources which forms unique man-made hydrological regime in the Mesopotamian rivers.
TO THE PROBLEM OF REGIONAL «BLACK-BOOKS» CREATION

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A task of working out the regional «black-books» is one of important steps for biodiversity conservation and reducing the negative consequences of biological invasions. “The black-book for flora of Middle Russia” is published (Vinogradova et al., 2010), “black-lists” for several regions were compiled (Geltman, 2003; Borisova, 2007; Krylov, 2008; Notov, 2009). Those activities should be continued for another regions of Russian Federation.

“Black-books” should comprise territories of different administrative levels: 1) Russian Federation; 2) biggest economical regions (North-West of Russia, Middle Russia, Verkhne-Volzhsky region, etc.); 3) administrative provinces.

Within different regions one particular species could have a different florogenetic status: 1) representative of native flora; 2) adventive but not naturalized species; 3) potentially invasive species; 4) aggressively invasive species. That regional florogenetic status depends upon a) climate; b) vegetation and extent of its disturbance; 3) geomorphology; 4) economic, cultural and historical peculiarities of the region and degree of acquired lands; 5) assortment of introduced species. E.g., Festuca arundinacea is a representative of native flora in southern regions of Middle Russia but clearly an aggressively invasive species in Verkhne-Volzhsky region. Atriplex tatarica became an invasive species within Middle Russia, but it is still not naturalized in northern regions of Russia.

Invasive species characterized as aggressive within a big economical region could be quite rare and fail in assimilating in native plant communities within its smaller regions (provinces). Thus, (unlike the situation with “red-books”) a species included in a “black-book” of federal level could be not listed in regional “black-books”, dealing with some subordinate provinces. As a rule, in southern regions of Middle Russia invasive potential of the adventive species is higher than in northern ones. A number of invasive species (Ambrosia artemisiifolia, Amaranthus albus, Xanthium albinum) in steppe in forest-steppe zones are aggressive weeds, producing a serious economical damage, while those species rarely (and occasionally) occur in northern regions and never naturalize there.

Regional traditions of forming the assortment of introduced species seriously influence the development of invasive group of species. E.g., in Verkhne-Volzhsky region Arrhenatherum elatius, Lolium perenne, Mentha longifolia, Physocarpus opulifolius, Sambucus racemosa, Zizania latifolia are more widespread than in North-West of Russia, because of their active cultivation within the former region. In Tver Province Caragana arborescens, Myosots sylvatica, Saponaria officinalis, Sorbaria sorbifolia, Trisetum flavescens, Viola odorata are more common than in another regions within Middle Russia, also because of their historical cultivation in mansion parks of noblemen.

If identification of taxonomically close adventive species is complicated we recommend to include those «complicated taxa» (like species of Aster, Helianthus, etc.) sensu lato in the respective «black-lists». Further investigations would clarify specific characters of each microspecies and its invasive potential.

Improvement and optimization of legal and regulatory frameworks are vital for invasive species’ control, as well as a coordination of all the activities for creation of regional «black-books» of different level.
MORPHO-ECOLOGICAL FEATURES OF ALIEN HYDROBIONTS IN THE Dnieper Reservoirs

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There is an intensive process of expansion of Ponto-Caspian fish, that adapt to the new living conditions, in reservoirs of the Dnieper today. In the oldest reservoir of the Dnieper - The Dnieper (Zaporozhye) Reservoir - during the period from 2000 till 2010 only fauna of fish and aquatic invertebrates was enriched by 6 new species of self-invaders: Bentophiloides brauneri (Perciformes), Synurella ambulans (Amphipoda), Rivulogammarus kischineffensis (Amphipoda), Eriocheir sinensis and Rhithropanopeus harrisi tridentata (Decapoda), Katamysis warpachowskyi (Mysidacea), which actively extend their historical natural habitats in Ukraine.

Researches of biology and ecology of alien species of the Dnieper were pursued from 2008 till 2010. There were analyzed 43 morphological characteristics of 7 fish species (240 specimens were tested).

Research objects were species that invaded in the Dnieper Reservoir: vertebral - Atherina boyeri pontica, Pseudorasbora parva, Neogobius melanostomus, Neogobius gymnotrachelus, Mesogobius hatrachocephalus, Neogobius kessleri, Bentophiloides brauneri; invertebrates are decapods Eriocheir sinensis and Rhithropanopeus harrisi tridentata.

The morphological analysis of alien invader fish of the Dnieper Reservoir educed considerable distinctions in morphotypes of all fish. The greatest changeability is marked for a-A, aA, aD and ro in 70% of cases. The greatest individual changeability was observed in Pseudorasbora parva (17 of 22 analyzed characteristics varied considerably).

Morphological changeability of Atherina boyeri pontica, Pseudorasbora parva, Bentophiloides brauneri, Neogobius melanostomus is so considerable, that distinctions in morphotypes of fish in the Dnieper Reservoir and individuals from the historical places of natural habitat reach a subspecific leve (CD reaches 2,88 and more).

It is proved that at present steady local populations of all invader species have arisen reliably in the Dnieper Reservoir.

The gobies Bentophiloides brauneri are the new species in the reservoir. For the first time one of them was caught in 2006. During 4 years of observation the species invaded along the whole upper section of the Dnieper Reservoir at a distance of more than 30 km

In 2002 in the reservoir was registered first for Ukraine (Novitsky, 2003) the Chinese mitten crab Eriocheir sinensis (female). In 2003 it was found out and in the Kakhovske reservoir.

On 6 November, 2009 another representative of Decapoda - Dutch crab Rhithropanopeus harrisi tridentata (Maitland, 1874) was first caught in the upper section of the Dnieper Reservoir. The crab was caught on stony biotope with a fishing net (diameter of mesh is 14 mm).

Researches of biology and ecology of alien species of the Dnieper keep on nowadays. Special attention is paid to hydrobiological researches of the Dnieper tributary rivers and artificial reservoirs of the region such as ponds and channels, due to which can go on invasion of new animal species.
DISTRIBUTION OF AMUR SLEEPER *PERCCOTTUS GLENII* DYBOWSKI, 1877 IN BELARUS

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From 2008 to 2010 we have studied the distribution of an invasive fish species originating from the Far East Amur sleeper *Perccottus glenii* Dybowski, 1877 in the waterbodies and streams of Republic of Belarus. The data have been collected by field-work, specialist interview and analysis of scientific literature. From 1970-th to 2010 this alien species has spread widely in the studied region. The map of the current Amur sleeper range was created for this territory and includes 186 points of it’s records. Invasive species had been noted in the basins of all large rivers of Republic. The highest number of records of Amur sleeper pointed out in the central part (the Dnieper River and the Neman River basins) and in the northwest of Belarus (the Zapadnaya Dvina River basin). On the territory of Republic the common habitat of Amur sleeper are different types of the ponds. Our data allow to assume, that spread of Amur sleeper on the territory of Belarus occurred from several different donor areas and this process occurred at different time in the separated regions. Now the *P. glenii* spread is continuing as result of unauthorized intentional introduction by fishermen and natural range expansion of the species.
THE GROWTH OF INVASIVE SPECIES – KILKA *CLUPEONELLA CULTRIVENTRIS* IN TSIMLYANSK RESERVOIR

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As the subject of research we are used the population of the *Clupeonella cultriventris* in Tsimlyansk Reservoir (Don river). The growth of kilka populations in reservoirs is still insufficiently explored but this is one of the main characteristics describing the population state. This takes on special significance when researching into allogenic species in new habitat.

The yield analysis have showed the kilka in Tsimlyansk Reservoir is distributed to five age groups (0+; 1+; 2+, 3+, 4+) among which three-year-old group is dominant (85.5% of yield). Usually in the reservoirs of the Volga kilka achieves only three years age (Osipov, Kiyashko, 2006). Standard length of examined fishes ranged from 16 to 74 mm. Inside the reservoir kilka hits puberty at 1+ age. There is one 4+ aged, 74 mm long and weighing 6.0 g specimen was registered in the yield 2008.

In comparison with data from literature (Trifonov et al., 1986) the growth rate of kilka in Tsimlyansk Reservoir is delayed (fig.). Especially of higher age groups. Hypothetically inside this reservoir the species delayed its growth after the outbreak of number which is typical for initial immigration stage.

The dimensional analysis of kilka in Tsimlyansk Reservoir showed the low asymmetry coefficient. It suggest stable state of this species population. It is also representative for the kilka in Caspian sea. Asymmetry coefficients of kilka was near zero in all explored reservoirs.
THE INVASION PLANTS OF RYAZAN REGION FLORA

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In 2009 there were 32 species of plant being naturalized in different types of Ryazan region sites and spread all over the region in many of its districts.


The wide-spread in oblast *Heracleum sosnowskyi* Manden., *Helianthus tuberosus* L. s.l., *Lupinus polyphyllus* Lindl., *Solidago canadensis* L., *Aster x salignus* Willd. are very active in dissemination in natural and anthropogenic environment. These species can widely luxuriate and change the plant community outlook.

INVASION OF ALIEN SPECIES IN HOLARTIC. BOROK – 3

INVASIVE PLANTS IN BRYANSK REGION

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Invasion is active distribution and introduction of adventive species in natural communities. Invasion leads to the change of flora and vegetative communities structure. Initial habitats of invasive species are synantropical communities and plantings in inhabited localities. Invasive plants of the Bryansk region and communities undergoing invasion are listed below.

*Acer negundo*, willow-shrub in river valleys, forests on slopes of ravines.
*Amelanchier spicata*, true mosses pine forest.
*Amorpha fruticosa*, true mosses pine forest.
*Aster salignus*, inundated meadows.
*Bidens frondosa*, inundated meadows, streamside communities.
*Bunias orientalis*, inundated meadows.
*Echinocystis lobata*, willow-shrub along a bed of rivers.
*Elodea canadensis*, standing stagnant and flowing reservoirs.
*Erigeron annuus, E. canadensis*, dry meadows.
*Festuca arundinacea*, fresh meadows.
*Fraxinus pennsylvanica*, inundated forest.
*Heracleum sosnowskyi*, edges of forest, riverside, slopes of ravines.
*Hipppophae rhamnoides*, amnicolous species.
*Impatiens glandulifera*, bottoms of ravines, along streams, alder forest.
*Impatiens parviflora*, disturbed forest, alder forest.
*Lupinus polyphyllus*, edges of pine forests and birch forests, slopes of ravines, fresh meadows.
*Oenothera biennis, O. rubricaulis*, dry meadows, edges of pine forests.
*Parthenocissus quinquefolia*, willow-shrub in river valleys, edges of forest.
*Solidago canadensis*, inundated and dry meadows, forest edges.
*Zizania latifolia*, streamside communities.
*Vinca minor*, broad-leaved forest, spruce forest.
"Aquatic Invasions" is an open access, peer-reviewed international journal focusing on biological invasions in both inland and coastal waters of Europe, North America and other regions (http://www.aquaticinvasions.net). The journal provides authors with their rights protection concerning primary geo-referenced records, biological monitoring and surveys as well as timely publication of reports concerning first alien species records. This contributes to rapid information dissemination, risk assessment procedures and early warning systems on aquatic invasive species. One of the key benefits of "Aquatic Invasions" is the timely and readily available publication of essential primary scientific information, which feeds into AIS management efforts and informs decision and policy making processes. This journal may also contribute to timely and coordinated eradication efforts of newly-found AIS. The fast and comprehensive peer review process of manuscripts serves as an effective quality control mechanism. "Aquatic Invasions" is also devoted to bridging the gap between scientific research and the applied use of science in decision-making, regulation and management in the area of introduction of invasive species and biodiversity conservation. The journal provides an international communication forum for professionals involved in research and management of aquatic invasive species. Currently "Aquatic Invasions" is supported by the European Commission seventh research framework programme through the enviroGRIDS project (Grant Agreement n° 226740), which covers publication cost of papers by authors from the Black Sea basin.
DYNAMICS OF POPULATIONS *BIDENS FRONDOSA* L. AND ITS HYBRIDS ON VOLGA RESERVOIRS

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Field supervision have shown, that soon after installation invasion species *Bidens frondosa* there are many of its hybrids with *B. tripartita* and fast enough disappearance of last. Already in the first (2002) year of supervision it has been noticed, that among plentiful *B. frondosa* thickets and *B. tripartita* have appeared hybrid individuals *Bidens × garumnae* (*B. frondosa × B. tripartita*), in 2005-2006 it was possible (far not in all points) to find only individual persons *B. tripartita*. During too time everywhere became much *B. × garumnae*. *B. frondosa* thickets have noticeably thinned, but in a plenty returnable hybrids *B. frondosa × B. × garumnae* began to meet. At the same time there were hybrids *B. frondosa × B. radiata*. In 2007 *B. tripartita* in one of points of gathering of seeds it has not noted been. Became a rarity pure *B. frondosa*, it became appreciable less *B. × garumnae*, returnable hybrid *B. frondosa* dominated, there were *B. frondosa* copies restored by the subsequent crossings which were very similar on typical *B. frondosa* but still carried attributes of *B. tripartita*. In 2009 everywhere dominated restored *B. frondosa* and *B. frondosa × B. × garumnae*, became much *B. frondosa × B. radiata*. Thus as a result of intensive natural hybridization the given local species has been absorbed by an alien species. Investigation is supported by grants of the fundamental researches Programs of the Russian Academy of Science «Biodiversity» and «Biological resources of Russia». 
FIRST FINDING OF DEEPWATER MORPH OF QUAGGA MUSSEL *DREISSENA BUGENSI S* IN THE EUROPEAN PART OF ITS RANGE

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Bivalve mussel *Dreissena bugensis* is one of the most active invasive species. At present it is widespread across Europe and North America. Together with another dreissenid species – *D. polymorpha* quagga mussel plays a great role in ecosystems. One of the reasons of considerable impact of *D. bugensis* on ecosystems is the presence of deepwater morph named “profunda”, which was discovered in Lake Erie first. Profunda mussels’ shell shape is morphologically distinct from typical *D. bugensis*, moreover deepwater morph maturates and spawns at lower temperature (Claxton and Mackie, 1998).

To present day profunda was known only from several Great Lakes of North America. Nevertheless specimens of *D. bugensis* fitting to profunda morph description (Dermott and Munawar, 1993) were found in the Cheboksarskoe Reservoir, one of the Volga River cascade reservoirs, in June 2009. The sampling site was located in the deepest part of reservoir (26.5 m depth) in power plant impact area, where current velocity exceeds 0.5 m/s. In shallower sites, located as close as 1 km to the deepest part, only typical quagga mussels were found.

Morphological analysis was carried out using traditional and geometric morphometric approaches. Morphological features of profunda mussels from the Cheboksarskoe Reservoir were (mean ± standard error): length 13.18 ± 0.146 mm; ratios of height to length (H/L) and width (convexity) to length (W/L) – 0.54 ± 0.005 and 0.35 ± 0.006 correspondingly. Shell shape analysis revealed high fitness between profunda mussels from the Cheboksarskoe Reservoir and those ones from Lake Michigan, which were used for comparison.

We suppose that deepwater morph of quagga mussel appears as the result of certain depth influence. The depth plays a role of a signal factor for activating “deepwater” developmental way.
WHAT IS THE IMPACT OF TWO INVASIVE SPECIES, BLACK BULLHAED (*AMEIURUS MELAS*) AND AMUR SLEEPER (*PERCCOTTUS GLENII*) ON LOCAL FISH FAUNA?

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The study is focused on the analyses of temporal and spatial trends of two invasive species black bullhead (*Ameiurus melas*) and Amur sleeper (*Perccottus glenii*) at the beginning of the invasion and on the evaluation of their impact on local fish fauna. The model area was situated in the south-east part of Slovakia that is restricted to the lowlands. Five types of sampled sites were sampled within the study (rivers, oxbow lakes, pits, drainage canals and channels). Fishes were collected using electrofishing covering all microhabitats. The sites were selected randomly within the whole study area during the years 2001-2007. Totally 223 samples were collected and 44 species were recorded.

Considering the nature of the data that do not meet normality (zero inflated data) or are presence/absence data, we selected the methods of the Generalised linear models (GLM) with negative binomial error distribution to analyse spatial or temporal trends of two non native species or with or binomial error distribution to evaluate the impact on local fish fauna. Both species show different temporal trends, where the relative abundance of Amur sleeper is more correlated with the time of invasion than it is in the case of black bullhead. Also several negative or positive impacts on local fish fauna covering economically important species as well as endangered species are highly significant.

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Red king crab (RKC) was introduced in the Barents Sea in about half an age ago. Till 2001 on the Russian part of Varanger fiord of the Barents Sea VNIRO carry out complex surveys of red king crab population dynamics.

Those surveys have two main aims: RKC stock assessment (dynamics of commercial RKC quantity) and monitoring of RKC reproduction (dynamics of RKC juveniles with carapax width around 45-80 mm).

The main method for assessment of dynamics of commercial RKC quantity is trap surveys, for dynamics of RKC juveniles – SCUBA surveys in depth range from the sublittoral to 40-50 m.

It was shown, that with such level of russian crab fishery, growth of local RKC stock in Varanger fiord waters was stable during 2002-2009.

In 2010 some decreasing of commercial males density was registered. One of the reasons of those decreasing may be climate condition: during the 2010 spring survey water temperature in the depth range from 0 to 30 m was around 4-5 °C, compare with same water temperature during 2001-2007 (1-2°C).

By the way, RKC juvenile density still increases with only some little changes according to seasons.

The highest concentrations of RKC juveniles were registered in two types of biotopes: in kelp forests of Laminaria digitata in the depth range 2-10 m, and on the gravel fields, covered by different species of Lithothamnion red algae in the depth range 30-40 m.

During the year highest RKC juvenile's density were recorded: in kelp – in spring flood period and during the polar night (December); on the gravel fields – during summer and autumn.

It was shown, that distribution of RKC juveniles was under significant influence of multiannual changes of kelp. From the other side, kelp forest were strongly depends of sea urchins distribution and abundance.

It was shown also, that modern conditions of main RKC forage objects (mussels, scallops, sea urchins) is good and over the RKC necessities of life. The reproduction of those RKC foodstuffs during 2001-2010 was on the good levels, changed only under climate factors and had no limit influence to RKC reproduction.
A representative of the Caspian fauna, leech *Archaeobdella esmonti* Grimm 1876, for the first time was recorded in the Rybinsk Reservoir in June 2009. This leech, well-adjusted to silty grounds, is an inhabitant of brackish waterbodies and an element of the Caspian Sea autochthonous fauna found in the Azov Sea, the mouths of the Volga, Don and Dnieper. By its range, it was considered to be a palaearctic endemic with a limited distribution (Lukin, 1976). However, at the end of the 20th century the leech started moving north. In 1990 *A.esmonti* was found in the Volgograd and Saratov Reservoirs by A.I. Bakanov (1993). This species was also noted in macrozoobenthos of the Cheboksar (Bakanov, 2005) and Kuibyshev (Zinchenko et al., 2008) Reservoirs. Besides, according to A.I. Bakanov’s unpublished data, *A.esmonti* was found by him in August 2001 in the Gorky Reservoir downstream of the town of Kostroma on a biotope of grey silt (at a depth of 6 m).

In June 2009 *A.esmonti* was observed at three stations in the Main part of the Rybinsk Reservoir and in September of the same year it was recorded in the Volga part of the reservoir. The leech occurred on silty ground: grey silt, shall rock, sand and peaty soils at depths from 7 to 14 m. The highest abundance of the leech was recorded in a zebra mussel biocenosis where the *A.esmonti* number amounted to 220 specimen/ m² (6.7% of the total) and the biomass - 10.65 g/ m² (33.3% of the total). Live leeches from the Rybinsk Reservoir had a light coloration of their bodies typical for representatives of this species: grayish-white and light-pink. Almost colorless specimens also occurred. Formalin-fixed worms had a white and slightly yellowish coloration. Leeches collected from the reservoir differed significantly in size and weight: mass of analyzed individuals varied in a wide range depending on the body length and width. The largest specimens were found in June at one of the stations in the Main part of the reservoir in the zebra mussel biocenosis where formalin-fixed leeches were 16-45 mm in length. The largest leech was 91.4 mg and the average mass of individuals – 48.4 mg. In August and September only small individuals were found in macrozoobenthos samples. Their length did not exceed 7.5-11 mm and weight – 4.5-9 mg. The size and weight characteristics of *A.esmonti* specimens from the Rybinsk Reservoir significantly exceeded those indicated for brackish waters where on silty grounds the observed maximum length of the leech was 33 mm, width – 3.5 mm and weight <20 mg (Mordukhai-Boltovskoi, 1940, Epshtein, 1968).

The life cycle of leeches of this species and their ecology yet studied little. A.I. Bakanov (1993) noted that *A.esmonti* was often found together with polychaeta *Hypania invalida* Grube the leech preys on. In macrozoobenthos samples collected in 2009, we did not find polychaeta *H. invalida*. Apparently, in the Rybinsk Reservoir *A.esmonti* feeds on small bottom invertebrates (worms, mollusks, crustaceous, insect larvae) like other representatives of the family Erpobdellidae swallowing their prey with the help of plicate pharynx (Lukin, 1976, Monakov, 1998).
WILL THE RISK OF PLANT INVASIONS INTO THE EUROPEAN ALPS INCREASE WITH CLIMATE CHANGE?

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Mountain ecosystems are not yet badly affected by invasions of non-native plants. However, many invasive plants of lowland ecosystems currently show a sharp elevational distribution limit at 1000 to 1500 m asl, which is likely linked to climate. In a warming climate these species may move upwards and in the future also threaten mountain ecosystems. We used presence-absence data from some 300 survey locations along roadsides ranging from 200 to 2500 m asl in Switzerland to fit species distribution models (SDM) that describe the current distribution of major invasive plant species in relation to climatic factors. We then predicted future potential distribution of these species based on different climate change scenarios. We discuss which invasive plant species may potentially become a threat to mountain ecosystems in the European Alps under different climate change scenarios.
WEB-ORIENTED INFORMATION RETRIEVAL SYSTEM AND DATABASE
«ALIEN SPECIES OF MAMMALS IN ECOSYSTEMS OF RUSSIA»

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The developed information retrieval system and the database on alien species provide information on mammals, for which the expansion of their range is observed: an independent one or as a result of deliberate or accidental introduction. Conceptual data model includes the attributes characterizing the systematic position and status of a species with a brief description of the ways of implementation, a modern distribution, a history of changes in the range, the results of acclimatization (reacclimatization) in different regions, the reasons for the expansion of the range, a forecast of the range change in the future and an impact of a species upon natural ecosystem habitats. For most species the maps of the range movement in the territory of Russia are presented. A great part of thematic maps is original, though it can summarize information from several separate literature and cartographic sources. Web-oriented version of the information system also includes the evidences of "new" species appearance, the peculiarities of their penetration into protected areas and an assessment of their role in ecosystems of 38 biosphere preserves of Russia.

The created information system is designed for solution of a number of important functional tasks: automation of collection, systematization and presentation of data via Internet, assessment of the parameters of diversity of alien mammals on Russian territory and the degree of "contamination" of Russian fauna (as a whole and as well as of separate regions), inventory of alien species for the territories of various sizes; identification of the patterns of alien species distribution in a particular area (the identification of settling trends and assessment of the participation in different types of communities); assessment of the environmental impact of alien species, the selection of indices for the development of the forecast of possible invasions and establishment of such a system. A further development of zoogeographic units of information system in order to create a common information space on chorological distribution of mammals and other animals, and especially of their invasion throughout Russia is planned.

The study was supported by the RFBR project NNIO_a number 09-04-91331 and the Grant of the Program for Basic Research of the Presidium of the RAS "Biological diversity".
DYNAMICS OF DISTRIBUTION OF THE FISH PERCCOTTUS GLENII IN EURASIA AND ITS IMPACT ON NATIVE AQUATIC FAUNA

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The native range of the alien invasive freshwater fish *Perccottus glenii* (Odontobutidae) is at the Far East of Eurasia. This species was brought outside its native range and self-spreads widely through North Eurasia. The dynamics and extent of its non-native range have been determined by analysing literature, museum collections, specialist responses to a questionnaire and data from four expeditions to West and East Siberia. New plots of the invasive range were described, but some previously reported areas were considered as unfounded. The spatio-temporal dynamics of the range during almost a century highlight features of the distribution which reveal mechanisms of the expansion. Up to the present time, this fish has been found outside of its native range in 47 regions (35 provinces, 9 republics and 3 territories) of the Russian Federation as well as in 15 other countries. The non-native distribution of *P. glenii* covers more than 100° West-East and almost 20° South-North. Rapid distribution of this species results in local declines of many populations of indigenous native aquatic invertebrates, fishes and amphibians. However some aquatic species have effective defense against predation of this fish. Persistence of native animals to *P. glenii* predation may depend on season, limnological characteristics, structure of ecosystem, systematic position, behavior and ontogenetic stage of the potential prey objects.
INVASION OF ALIEN SPECIES IN HOLARTIC. BOROK – 3

PREDICTIONS OF THE FUTURE RANGE EXPANSION OF THE FISH *PERCCOTTUS GLENII* USING BIOCLIMATIC MODELS

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The fish *Perccottus glenii* Dybowski, 1877 (family Odontobutidae) is one of the most widespread alien invasive freshwater fish in Eurasia. Our method approach integrated the classical correlative species distribution models (SDM) with the available biophysical and physiological information. This produces more robust models than the simple correlative approach considering comprehensive sets of environmental variables. We built three models: native model, calibrated using the records within the native range of the species; invasive model, calibrated using the records within the invasive range; all data model, calibrated using all presence records within Eurasia. SDM results with independent validations showed that (1) *P. glenii* distribution in Eurasia has climatic limitations; (2) *P. glenii* have already invaded most of areas with high climatic suitability in the Palearctic, but (3) several areas of western Europe and Asia, where this species is currently absent, have high climatic suitability and may be invaded in the future. Expansion of this fish within appropriate climate limits in Europe is very likely in the near future, because of lack of geographical barriers and to interconnection of some rivers by artificial canals. Japan, southern British Isles and part of North-American continent are also within potential range of *P. glenii* but geographical barriers may prevent or delay invasion.
TESTING THE HYPOTHESIS ABOUT HISTORY OF INTRODUCTIONS OF THE FISH *PERCCOTTUS GLENII* USING PARASITOLOGICAL APPROACH

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Two alternative hypotheses about aquarium vs. fish farm sources of non-native distribution of the invasive freshwater fish *Perccottus glenii* (Odontobutidae) within the Volga river basin, Eurasia, were tested using a parasitological approach. Two distant localities where *P. glenii* populations were assumed having the different introduction histories where studied. 112 individuals of this fish species from four water bodies of the middle part of the Volga basin and 100 individuals from three water bodies of the lower part of the same basin were investigated. We concentrated on specific parasite species originated from the native range of this fish. *P. glenii*-specific monogenean *Gyrodactylus perccotti* and odontobutid-specific tapeworm *Nippotaenia mogurnda* were recorded from water bodies of low Volga. The tapeworm was more informative species because it has complex life cycle and therefore does not persist in aquarium conditions. Absence of this tapeworm is in an agreement with the hypothesis that *P. glenii* populations in Moscow province (the middle Volga) originated from aquarium specimens. On the other hand, populations of this fish from the low Volga, where nippotaenia occurs, could originate from individuals unintentionally transported to fish farms together with commercial fish species. Thus, obtained parasitological data are in agreement with available information concerning introduction history of the fish *P. glenii*. 
INTRODUCTION OF VENDACE (COREGONUS ALBULA) IN PASVIK RIVER ECOSYSTEM

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Introduction of exotic species into areas where they do not naturally occur, is an important cause of ecological disturbance and loss of biodiversity. The translocation of fish species has become a problem of global extent and in freshwater communities there are numerous examples of negative impacts of new species. In many studies of introductions effects of the new species on the resident community have been found, but. However, many attempted introductions have also failed. Further, some fish communities appear to have a strong ability to resist invasions by introduced fishes related to interaction and structural complexity at the community level. The success of invaders and effects of invasion on the receiving communities, therefore, are difficult to predict.

Vendace (Coregonus albula) was introduced to tributaries of Lake Inari in the subarctic Pasvik watercourse in the boarder area between Norway, Russia and Finland in 1956 and 1964-1966. The species was first time recorded in the fishery catches in Lake Inari in 1973, and has been observed regularly in the lake since 1978. During the late 1980’s the vendace population size in the lake increased dramatically, sparking a large-scale fishery which increased from a total catch of 380 kg in 1983 to a maximum annual catch of 300 tonnes of vendace in 1989. The dramatic boom in the vendace abundance during the 1980’s was followed by an abrupt bust in the early 1990’s, and after 1994 the annual vendace catches in Lake Inari have been below 10 tonnes. In 1989, the vendace was first time observed in the Pasvik watercourse, the outlet river system of Lake Inari. In Ruskebukta, in the upper part of the Pasvik watercourse, the vendace density increased rapidly after the invasion, reaching a maximum population density in 1998. Similarly to the population development in Lake Inari, the boom in vendace density in Ruskebukta was followed by a dramatic bust, with a 93% decline in catch per unit effort (PUE) from 1998 to 2000.

After the invasion of vendace we observed the changes in the structure of fish community in Ruskebukta: 1) Vendace has become the dominant species in the pelagic zone, decrease in the contribution of densely-rakered whitefish (29-40 gill rakers); 2) Replacement of plankton-feeding densely-rakered whitefish from the pelagic zones to the profundal and littoral zones; 3) Changes in the food web (zooplakton, shift of densely-rakered whitefish from zooplankton towards bottom animals, increasing the role of vendace in the food rations of piscivorous fish). The level of effect of predaceous fish on whitefish and vendace population in the Pasvik watercourse is variable in different years. Different phase of introduction new species in ecosystem may be recognized: 1) latent or hide period; 2) – burst phase (rapid increasing in population abundance); 3) - fall phase (sharply decreasing) and 4) – phase of stabilization (Reshetnikov, Popova, Amundsen, 2010). The invasion of vendace (Coregonus albula) to the subarctic Pasvik watercourse in the boarder area between Norway, Russia and Finland constitutes an example of a fast and successful invasion of a specialist (Amundsen et al., 1999; Bøhn et al., 2008). Vendace invasion has successfully passed the arrival and establishment phase, but introduction in ecosystem is still in progress.
INFLUENCE PARASITES ON THE PROCESS OF NATURALIZATION ALIEN MAMMALS SPECIES

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A known example of intentional introduction of "useful" mammals organisms is the resettlement of raccoon dog (*Nyctereutes procyonoides*) in the European part of Russia (Yudin, 1977). In the 30th years of last century a raccoon dog has been acclimatized in the Central Chernozem Region (50 pairs of this animals were released in Voronezh Reserve in 1936). This predator have a high ecological plasticity as "polyphage-collector", and it's easy to him adapt in new conditions: during the period less than 20 years it occupied the Voronezh region and infiltrated the adjacent territory. However, a sustained reduction in the number of raccoon dogs was registrated in the late 70's of last century. Now this species is on the edge of extinction, and Voronezh Reserve is not the exception in that attitude. There is necessary to explain the possible causes of such numerical depression of this species.

During past 20 years we collected materials from dead raccoon dogs founded in Voronezh reservation. There were studied about 10 carcasses of animals. We usually found frozen animals in the first half of winter - (from the end of December to first weeks of January.) The degree of invasion these animals by larvae of trichinella (*Trichinella nativa*) was relatively high - from 300 to 2000 larvae per 1 g of muscle tissue (average 702). This rate was higher (p < 0,001) than we found in the native species of predators - foxes (average 9,4 larvae/g), wolfs (7,3 larvae/g) and pine marten (11,3 larvae/g). The high expansion of trichinella invasion was registrated in the native predators: foxes - about 50%, wolfs and badger - about 30%, pine marten - higher than 60%. Such dates indicate the stable functioning of parasitic system of trichinnells. Our observations and composition of ration raccoon dogs (this species - pronounced necrofag) are important prerequisites pointing to the successful integration of the raccoon dog in this parasitic system. The mechanism of elimination of raccoon dog can be represented as follows. The high intensity of trichinella invasion causes severe pathology which leads to termination of hibernation and subsequent death of animals. By our calculations period of formation parasite system on the population level with the inclusion in it a new type of host (from the date of introduction) to the stable functioning was about 30 years. We believe that the "local forms" of trichinellas can be attributed to one of the key factors which regulates (by causing elimination) the size of raccoon dog's population in the places of introduction. Firstly these conditions are established in natural ecosystems which stable natural foci of trichinosis. The results of study indicate one of the important functions of the parasites - the protection of ecosystems from the invasion of alien species of mammals.
Successful invasion of the red king crab in the Barents Sea raised a question on its impact on the benthic communities and populations of native species of macro-invertebrates. To respond on this question we studied the role in the crab diet, the population structure, and if possible, long-term changes in the populations of echinoderms Strongylocentrotus spp., Asterias rubens, Cucumaria frondosa, mollusks Chlamys islandicus, Modiolus modiolus, and decapod Lithodes maja in several inlets of the Barents Sea.

The role of these animals in the crab diet varied significantly. Sea urchins Strongylocentrotus spp. is one of the main components of the diet; starfish A. rubens also is a common prey, while sea cucumber C. frondosa was not found in its digestive tracts at all, that may be caused by the absence of noticeable firm structures in their bodies. Fragments of both mollusks juveniles were found in digestive tract of crabs occasionally. Lithodid crab L. maja is not a prey of the red king crab, but their food preferences are similar.

Sea urchins were common and numerous in the studied areas. However, comparison with the data obtained 40 year ago in the Dal’nezelenetskaja Inlet demonstrated that their average density and biomass on the open surfaces decreased in 4.3 and 1.4 times respectively, while average weight of one specimen and maximum size have increased. Besides, sea urchins became a dominant species in some benthic communities or their significance in the other communities noticeably increased. Starfish A. rubens was common, but not numerous in all Inlets. Insignificant decreasing of its density for forty years period was observed. Single specimens or small groups of sea cucumber C. frondosa were found accidentally hidden in the crevices or under the boulders, while its uniform aggregations of low density on the exposed substrata were common before crab invading. Iceland scallop formed beds in the inlets Dolgaja and Jarnyshnaja (average density 1.23 sp.m-2; max – 25 sp.m-2; average biomass 94 g m-2, max – 1499 g m-2.), while its single specimens were found in all studied inlets. The decreasing of scallop stock was observed in the Jarnyshnaja Inlet during 2004-2006 years. Horse mussel M. modiolus inhabited all Inlets, however its extensive settlement (average density 124 sp/m2; biomass – 5597 g/ m2) were found in Jarnyshnaja and Medvezhja Inlets only. Decreasing of this species density and mean shell length was observed in Dal’nezelenetskaja Inlet during 2002-2005. Stone crab L. maja was rather scarce and its number varied significantly from year to year.

It is probable that changes in sea urchin population were really connected with consumption of its juveniles by crabs at the exposed bottom. This leaded to relocation of urchin juveniles towards refuges, decreasing of intra-specific competition, and as a consequence, increasing of their mean size and weight. Negative tendencies in the population dynamic of island scallop in the Jarnyshnaja Inlet were likely related with illegal catch by divers and trawling. As to M. modiolus we believe that changes observed were related with natural mortality, rather than crab predation, since big specimens are inaccessible for crabs. Reasons of density and location changes of C. frondosa are not evident, since the role of the species in crab diet not obvious, fishery is absent, and environment is not polluted. Fluctuations of L. maja density rather related with location of the studied sites at the border of the area, than with interspecific interaction with red king crab. Thus, some changes in the population structure of macro-invertebrates were observed that may be considered as a result of invaded red-king crab impact. However, in the most cases they were caused by other anthropogenic or natural causes.

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ON ROLE SHIPS’ BALLAST WATERS IN DISTRIBUTION OF PLANKTON SPECIES IN THE NORTHEASTERN BLACK SEA

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In the port of Novorossiysk in 2004-2005 for the first time in Russia a study was initiated to investigate aquatic organisms in ships’ballast waters (Selifonova, 2009). It has been established that the most probable is the risk of introduction of Mediterranean species into the Novorossiysk Bay. The basic "groups of risk" are copepods and polychaetes. It has been supposed, that ships’ballast water can become a primary factor of “mediterranization” of copepod fauna (Copepoda) in the northeast of the Black Sea. A mass number of the cyclopoid copepod Oithona brevicornis Giesbr., a new species for the Black Sea, was recorded in samples collected in autumn 2005 and 2006. For the period of research in the Novorossiysk Bay, 36 species of Mediterranean copepods were recorded. The status of invader was attributed to the polychaete of Streblospio gynobranchiata Buch.

In 2009-2010 researches of the ballast waters of commercial vessels in the port Novorossiysk and biological invasions in the port areas of the Northeastern Black Sea were continued.

The plankton in ships’ballast water of the Super Lady tanker consisted of 33 phytoplankton taxa, 16 taxa of ciliates, 2 – rotifers, 3 – meroplankton, 14 – holoplankton. The tanker came to Novorossiysk from Amsterdam in October 2009. In the ships’ballast water organism unusual for the Black Sea (17 taxa), including the phytoplankton Thalassiosira nordensioidii Cleve, Rhizosolenia setigera Bright, R. cf. styliformis Bright, Lithodesmium cf. undulatum Ehren, Odontella sinensis (Grevielle) Grunow, ciliates Eutintinnus spp., Favela sp., Tintinnopsis fimbriata Meun., rotifers Synchaeta neapolitana Rousselet, Synchaeta sp., copepods A. bifilosa (Giesbr.), Clausocalanus arcuicornis (Dana), Centropages kroyeri Giesbr., Ctenocalanus vanus, Giesbr., Microcalanus pygmaeus (Sars.), O. brevicornis Giesbr. were found. The heterotrophic bacteria density attained 4.7·10⁶/ml, phytoplankton – 18.4·10⁶/m³, ciliates – 116.9·10⁶ ind/m³, rotifers – 12.5·10³ ind/m³, meroplankton – 480 ind/m³, holoplankton – 21.6·10³ ind/m³.

The water salinity in the ballast tanks reached 20.05‰. The water salinity was 17-18‰ in the Black Sea, 30-35‰ in the Mediterranean and the North Seas (Sukhovei, 1986). A species are a widely spread in the moderate waters of the Atlantic ocean, the North, Black and Mediterranean seas were recorded in the ballast water of Super Lady tanker. Hence, it follows that the crew of commercial vessel have executed the partial change of ballast water (Selifonova, 2010).

The overwhelming portion of the fauna revealed in the ballast water was ciliates Strombidium conicum (Lohm.) – 13 ·10⁶ ind/m³, non identified oligotrichids – 65·10⁶, Tiarina fusus Clap. et Lachm.) – 5.4·10⁶ ind/m³ and Myrionecta rubra (Lohm.) – 27·10⁶ ind/m³ (living samples). The finding of M. rubra was greatest interest. In areas of intensive eutrophication along the Northwestern - west coast of the Black Sea it forms massive “red” tide blooms (Sorokin, 2002). Water acquire a red colour at midday, when the biomass of migrating M. rubra at the surface reach 100-200 g/m³.

A total 9 tintinnid species were observed in the ballast water. The most frequently observed neritic species in the preserved samples were Metacylis mediterranea (Mereschk.) Jorgensen, Stenosemella nivalis (Meun.), Tintinnopsis fimbriata Meun. Many of the species like Eutintinnus spp., Favela sp., that were observed in these ballast water samples nave also been found in the nearby area oil harbour in the Novorossiysk bay. Tintinnids from genus Eutintinnus
(E. lusus-undae Entz., E. angustatus (Daday) Kof.& Camp., E. tubulosus (Ostenfeld) Kof.& Camp., E. haslace Taniguchi & Hada, E. sp.), Favella brevis (Laackmann) Kof.& Camp., Salpingella sp.(rotundata) Kof.& Camp., Tintinnopsis directa Hada are reported the first time from the open part of the Black Sea and Novorossiysk, Sevastopol Bays in 2001-2004 (Gavrilova, 2005). Thus it is highly likely that some tintinnid species have been successfully established in the Northeastern Black sea due to ballast water transport. The presence of ciliates in ballast water obfuscates any conclusions about the natural distributions of these species (Pierce et al., 1997).

Live individuals of Oithona brevicornis Giesbr. (4600 ind/m$^3$) were found in samples taken from ballast water Super Lady tanker. The population consisted of 100% of females without eggs and copepodits of older ages. For example, density of mass species genus Acartia and genus Calanus in the ballast water achieved 9000 ind/m$^3$. Such a high abundance of crustaceans in the ballast waters gives it rather a large change of surviving in the new conditions of recipient waterbody. O. brevicornis is a seasonal allochtonous migrant, that formed a temporal population capable of reproducing in the Novorossiysk bay (Selifonova, 2009). This cyclopoid copepod was most probably brought into bay in the ballast water of a ship. Literature (Gubanova, Altukhov, 2007) and the author’s data show the increasing density of O. brevicornis in ports of Sevastopol’, Novorossiysk and Tuapse in autumn. Crustacean abundance increased to the end of autumn (1000-1600 ind/m$^3$), while the species was not registered in samples in February-May. In 2007-2008 in the Novorossiysk bay O. brevicornis abundance was unexpectedly low (only a few ind/m$^3$). In November 2009 its abundance increased to 3500-10 000 ind/m$^3$, in the Tuapse, Gelendzhik and Anapa bays − 2500-5500 ind/m$^3$. Hence, copepod O. brevicornis was distributed along Northeastern Black Sea. In February-March 2010 in the Novorossiysk and Tuapse bays density of O. brevicornis decreased to 100-200 ind/m$^3$. Males and females with egg pouches, copepodits were marked during all period of researches. Thus it is highly likely that O. brevicornis have been successfully established in new location due to ballast water transport.

This study suggests that ballast water has been a vector for plankton transport for many years, and that it may no longer be possible to determine the native distributions for many ciliates and copepods species.
THE POPULATION STRUCTURE OF ALIEN SPECIES OF FISHES IN KUYBYSHEV WATER RESERVOIR

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The alien species of the water reservoir include: Black Sea sprat, vendace, European smelt, nine-spined stickleback, Amur sleeper, round goby, Caspian big-headed goby, tube-nose goby, monkey goby, stellate tadpole goby and black-striped pipefish.

The material was collected in water reservoir in 2001 – 2009.

The first alien species of the water reservoir (1956 – 1957) was European smelt; at the present moment its numbers are extremely low, due to which fact there is no representative data on its population structure. Monkey goby, discovered in 2007, was found occasionally, thus, there was no opportunity to provide representative sampling. The population structure of the other species is represented in the table below:

<table>
<thead>
<tr>
<th>Species</th>
<th>Year of discovery</th>
<th>Correlation of ♀ and ♂</th>
<th>Maximum age, years</th>
</tr>
</thead>
<tbody>
<tr>
<td>Black-striped pipefish</td>
<td>1962</td>
<td>1.4 : 1</td>
<td>4</td>
</tr>
<tr>
<td>Vendace</td>
<td>1964</td>
<td>0.4 : 1</td>
<td>3 *</td>
</tr>
<tr>
<td>Black Sea sprat</td>
<td>1964</td>
<td>1.8 : 1</td>
<td>3 *</td>
</tr>
<tr>
<td>Round goby</td>
<td>1968</td>
<td>1.7 : 1</td>
<td>4 *</td>
</tr>
<tr>
<td>Stellate tadpole goby</td>
<td>1970</td>
<td>1.3 : 1</td>
<td>2</td>
</tr>
<tr>
<td>Amur sleeper</td>
<td>1981</td>
<td>1 : 1</td>
<td>4</td>
</tr>
<tr>
<td>Tube-nose goby</td>
<td>2002</td>
<td>0.6 : 1</td>
<td>2</td>
</tr>
<tr>
<td>Caspian big-headed goby</td>
<td>2003</td>
<td>0.6 : 1</td>
<td>5 *</td>
</tr>
<tr>
<td>Nine-spined stickleback</td>
<td>2007</td>
<td>0.7 : 1</td>
<td>3</td>
</tr>
</tbody>
</table>

* – attained by ♀

As it is apparent from the table, all the species refer to short-cycle ones. The maximum age groups are, as a rule, attained by females. The species which had settled in the water reservoir earlier, have mostly a stable gender and age structure with the domination of females or with the equal correlation. The species which settled in the water reservoir relatively a short time ago are marked by the domination of males. It is probable that the domination of males makes the population more evolutionally flexible, males being the avant-garde of the evolution.
ESTIMATION OF INFLUENCE THE NON-INDIGENOUS CLADOCERAN EVADNE ANONYX G.O. SARS, 1897 ON NATIVE SPECIES IN SOUTH-EASTERN PART OF THE BALTIC SEA

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The Ponto-Caspian basin is one of the principal donor regions of alien species for the Baltic Sea area. It is currently connected to the Baltic Sea basin by a complicated hydrographic network, where the Volga–Baltic waterway represents the main invasion corridor.

In the present study we report the establishment in the south-eastern part of the Baltic Sea of the Ponto-Caspian onychopods, *Evadne anonyx* G.O. Sars, 1897 (Crustacea: Cladocera: Onychopoda), a common zooplankton species from the Caspian Sea. *Evadne anonyx* introduction was first recorded in the different parts of the Gulf of Finland in 1999, 2000 and 2004 and in the Gulf of Riga in 2000 (Litvinchuk, 2005; Pollupu et al., 2008; Radionova, Panov, 2006). But there is no reports about *Evadne anonyx* in the south-eastern part of the Baltic sea. As the fecundity of the alien *E. anonyx* significantly exceeds that of the native *E. nordmanni* in Gulf of Riga, population abundance of *E. anonyx* will very likely increase in future and the species may colonize new areas in the recently invaded ecosystem (Pollupu et al., 2008).

Zooplankton samples were collected in the south-eastern Baltic sea over eleven years (1998–2008) at 30-35 stations. The samples were collected with the use of a quantitative Juday net, 0.37 m in diameter with a mesh size of 100 mkm, in three replicates from surface layer (100–0 m). The samples collected were fixed with a 4% formalin solution and subsequently processed under laboratory conditions, including determination of the species composition, abundance and biomass of the zooplankton organisms, and the size and sex structures of the populations of alien species. Totally 804 samples were collected. In addition, water temperature was measured in the surface layer (at depths 0.5 meters) during each sampling effort.

In 2007 the Ponto-Caspi-Aralian endemic *E. anonyx* was first found in the observed area during the entire period. *E. anonyx* females occurred at water temperature 16–20°C. *E. anonyx* abundance and biomass were low and varied in August 2007 from 8 to 11 ind./m³ and from 6.2 to 8.4 mg/m³ respectively. Average *E. anonyx* abundance and biomass in this period were 0.5 ind./m³ and 0.37 mg/m³ respectively. In 2008 *E. anonyx* abundance and biomass varied from 2 to 7 ind./m³ and from 0.3 to 4.3 mg/m³ respectively. Average *E. anonyx* abundance in June 2008 was higher, than in August 2007 - 0.8 ind./m³ and average biomass was less - 0.33 mg/m³.

Abundance and biomass native *Evadne nordmanni* Loven in August 2007 was in 2201 and 783 times higher, than abundance and biomass *E. anonyx*, and in June 2008 in 1060 and 240 times higher respectively. In 2007 *E. anonyx* was registered in August at 2 stations, and in 2008 – in June at 7 stations. Thus the area of *E. anonyx* in 2008 has dilated.

At present time no the ecological effect of *E. anonyx* manifested in the investigated area the Baltic sea. But investigations should be proceed, because average parthenogenetic fecundity was higher for *E. anonyx* than for native *E. nordmanni* (Pollupu et al., 2008) and there is a threat to native species in years with high temperature in summer.
ROLE INVASION TYPES IN FEEDING OF RAVENOUS FISH OF KUIBUSHEV RESERVOIR

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Today invasion types become integral component of ichthyofauna of Kuibushev reservoir and exists cut-in them in settled chain of food organisms of waterbody. So has come of kilka (*Clupeonella cultriventris*, Nordmann, 1840), occupying first place on occurrence in composition of the food component of the pike perch moreover share it in spectrum of the feeding of this predator only grows. The noted fact of the feeding the perch of Kuibushev reservoir brand-rotan (*Perccottus glenii* Dybowskii, 1877), kilka, round (*Neogobius melanostomus* (Pallas, 1814)) and gobies (*Benthophilus stellatus* (Sauvage, 1874)).

The special interest present the studies of the feeding the burbot of Kuibushev reservoir, where at the first years of the operation of waterbody main component of his feeding were shown fish family of Percidae, and in particular ruff. The total reduction of the number of the ruff exists with 80-h years 20 centuries in waterbody, as a result of deteriorations of the conditions his of dwelling that was reflected on feeding the burbot. In consequence of reduction of the number of the ruff in waterbody, the burbot has increased its spectrum of the feeding to account of the cut-in in it round, occupied essential place in count calculate his food component. The frequency of occurrence goby in feeding the burbot forms 100%. Beside 40 % burbot main forming food wad is a goby, beside rest explored fish in feed ration dominated younger of Cyprinidae and goby. The number goby in belly varied from 3 before 6 copies, forming at the average 5,1. The analysis of the comparison of the feeding the ruff and round of Kuibushev reservoir have revealed the possibility of serious their competition, since spectrums of the feeding these type very gangplank. In established at present situat on Kuibushev reservoir on necessary complex studies and analysis trophic relationships of invasion with aboriginal type that in determined measure will allow to reveal their role and importance in ecosystem of waterbody.
INVADER SPECIES IN THE ZOOPERIPHYTEON OF THE TYUMEN REGION

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In spite of a great number of reservoirs and channels, relatively quite a small amount of invader hydrocoles are met on the territory of the Tyumen region. The main reason is the existence of ecological barriers – a huge still zone with deficiency of oxygen during the under-ice period and a low mineralization of water in the most of reservoirs of the forest zone.

Invader species are met in the cooler reservoir of the Heat and Power Plant, it does not freeze within the winter period because of high temperatures and it has favorable oxygen conditions all the year round. In the zooperiphyton of the cooler reservoir four species of invasion mollusks have been found. The most dominant kind of the invaders is Ferrissia wautieri Mirolli – it is found all over the reservoir, at a number of Heat and Power Plants it is included into the complex of predominating species, as for the biomass. Physa acuta (Drap.) is common and it is more often met in the zone of moderate heating within the autumn period, findings of Borysthenia naticina (Menke) and Costatella (Physella) integra (Hald.) are individually marked.

One more finding is connected with the Irtysh River – near the city of Tobolsk in the zooperiphyton and drift the hydroid of the Caspian origin Cordilophora caspia (Pall.) is found. The hydroid was found in 1988 only, there is no steady population in the mid stream. The emergence of the species is possibly connected with dissemination down the stream of the Irtysh River from the Bukhtarmainsky reservoir into which several kinds of Caspian species were settled.
EFFECT OF KEYSTONE SPECIES ON DIFFERENT FRESHWATER ECOSYSTEMS IN THE NORTH–WEST OF RUSSIA

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Nowadays the biological invasion is the most acute modern problem concerning many waterbodies of the world including the waterbodies in the north-western Russia. Therefore, the understanding of the role of alien species (first of all dreissenids as medium–forming species) in aquatic biocenosis formation and transformation of ecological conditions in waterbodies is an urgent issue of today.

Dreissena is the most important ecological factor in formation of the modern state of ecosystems in lakes and reservoirs. The most prominent changes in the macrozoobenthos structure in the Upper Volga Reservoirs and their ecosystems occurred under formation of stable biocenoses of dreissenids in waterbodies. It is especially strongly pronounced in the Rybinsk Reservoir where both stages of the water deeutrophication were closely related to distribution of two dreissena species in the reservoir: at the beginning of the 1970s – *Dreissena polymorpha* and at the beginning of the 1990s – *D. bugensis*. Dreissenids are filter feeding aquatic organisms and reach high densities in the studied lakes and reservoirs. They grasp a significant portion of organic matter thus preventing its deposition and burying in bottom sediments of the lake profundal and flooded river channels.

It has been determined experimentally that the high density of *D. Polymorpha* not only increase the species diversity and size structure of introduced species in the macrozoobenthos structure but its druses refuges large–size macroinvertebrates from predation by perch yearlings. The comparative analysis of the macrozoobenthos biomass structure of *D. Polymorpha* biocenoses has shown that under natural conditions it is mainly formed by polichaeetes, chironomids, oligochaetes and crustaceans whereas in the experimental conditions it is formed by chironomids and leeches.
TREND ON INCREASING THERMOPILE NON-NATIVE SPECIES IN THE BLACK SEA LINKED TO CLIMATE CHANGE.

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In the 20th century, especially in its second half, under the influence of climatic and anthropogenic factors, significant changes have occurred in the diversity of the flora and fauna of the Black Sea. Among the factors mentioned, the occasional and sometimes intentional introduction of non-native species of animals and plants is a global phenomenon that has not avoided the Black Sea as well. As a result, the Black Sea became a basin—recipient for many non-native species of different origins. The main reasons were increasing human activities first shipping intensity, deliberate stocking, unintentional releases etc. Resulting in all these alterations the high numbers of no-native species arrived and established in the Black Sea. All together 152 (or 161?) species, which belong to different taxonomical groups. The most pronounced events were arrival of two warm water ctenophores: Mnemiopsis leidyi and Beroe ovata into the Black Sea. First one affected all trophic web of ecosystem and became the main drivers of the Black Sea ecosystem functioning. The stocks of most of commercial fish greatly dropped (Shiganova et al., 2003; 2004). While the other one considerably recovered ecosystem for rather short period. Mnemiopsis leidyi spread from the Black Sea to the Sea of Marmara, the Aegean Sea with the Black Sea currents and in some areas of Mediterranean with ballast waters (Shiganova et al., 2001; Shiganova, Maley, 2009; Galil et al., 2009; Boero et al. 2009; Fuentes et al. 2009).

In addition during last decades temperature increased both in the surface mixed and the cold intermediate layers, which facilitates the increase population of thermophilic species and their northward expansion from the Mediterranean. Until recently new Mediterranean species have been recorded temporally or permanently mainly in the near-Bosporus region. Therefore, they are usually not regarded as established non-native species. But if we take into account only established Mediterranean species, their share in total numbers of non-native species consist of 36%.

With the Bosporus Strait with Low-Bosporus current deliver many Mediterranean species different taxonomic groups. But selected Mediterranean species of phyto-, zooplankton, benthic and fish species more and more often are recorded also off northwestern and northeastern coastal areas.

The process of establishment of the species that have already invaded into the sea is also proceeding. Selected species of this kind may temporarily become subdominant species, but, as a rule, they remain rare or are abundant only in definite years, which suggest a high stability of the communities of the Black Sea with respect to establishment of non-native species or conditions of the Black Sea with low salinity and low winter temperature do not favor them to keep self-sustaining population of the most of these species particularly representative of Copepoda.

Significant range northward extensions have been recorded for the Mediterranean fishes, seasonal migrants in the Black Sea. Most of them were recorded earlier in the Black Sea as seasonal migrants but now they extended area of distribution in the Black Sea. Some of them have changed phenology: they used to spend short period of warm seasons in the Black Sea for spawning/and feeding but now some of them now stay longer in the Black Sea, intensively reproduce and even most probably stay for overwintering, what were not observed earlier (the dorado Sparus aurata, the salema Sarpa salpa).

Recently several Mediterranean jellyfishes penetrated first to the Sea of Marmara. Among them jellyfishes Chrysaora hysoscella, Cassiopea andromeda, Trachimeda Liriope tetraphylla. In 2009 Chrysaora hysoscella was recorded for the first time in the Istanbul Strait and Turkish part of the Black Sea (Öztürk and Topaloglu, 2009).
New event for the Black Sea became appearance of species of Indo-Pacific origin. Some of them are Lessepsian migrants, which arrived to the Mediterranean than expanded from the Mediterranean Sea to the Black Sea; others were brought with ballast waters.

Not all non-native Mediterranean species are harmful for the Black Sea ecosystem with exception gelatinous species. The rising of the numbers of species, abundances and areas of distribution of gelatinous plankton both native and invaders are the most dramatic events for Mediterranean, Sea of Marmara and the Black Sea. Expansion of gelatinous species from the Mediterranean to the Sea of Marmara and after that farther to the Black Sea is particular threat for their ecosystems. Continuation of expansion of aggressive the Black Sea invader *Mnemiopsis leidyi* in different areas of the Mediterranean Sea is also give particular concern.
ABOUT INVASIVE ZEBRA MUSSEL’S IMPACT (*DREISSENA POLYMORPHA*) TO NATIVE BIVALVES POPULATIONS

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The researches of invasive processes have many ecologically important aspects. The basic question is: how native organisms and invasive co-operate among themselves? This work is devoted to our research of interactions between bivalves of family Unionidae (native organisms) and invader species Zebra mussel (*Dreissena polymorpha* Pall.) in one cooling pond of nuclear power plant of Ukraine. The joint settlements of Unionidae and *D. polymorpha* in cooling pond of Khmelnitskiy nuclear power plant (KhNPP) were investigated during summer seasons 1998–2009. The samples were collected from depths 0.5–6.0 m using SCUBA equipment with the frame 0.5×0.5 m.

After the beginning of functioning of the second power unit of the nuclear power plant and *Dreisena* invasive, since 2005 species structure of Unionidae populations was reduced: only *U. tumidus* and *U. pictorum* were noted. The second species met seldom and in individual specimens. Live *Anodonta* has not been met, on all investigated sites were found only its shells.

Populations of Unionidae (1999, 2001, 2005–2009) have been presented by rather large molluscs. The average size has increased from 55.2 mm in 2001 to 80.0 mm – in 2009. Young individuals, with size less 20 mm have not been noted. Number of *Unio* decreased from 15±3.2 to 5±1.8 ind/ml (from 2005 to 2009). The biomass fluctuated from 271.5±104.0 to 490.6±146.0 g/m² and remained at same level as the individual average weight increased from 16.8±1.6 g in 2005 to 52.6±2.1 g/m² in 2009. The maximum size of *Unio* was 101.1 mm in 2009.

The *Dreissena* settlements (druses) on living *Unio* occupied on the average about 30 % of a total area of the mollusc shell. These settlements have been noted at 4 m depth in 2005–2007, and at 2 m depth only in 2008–2009. In epibiotic druses of *Dreissena* are registered the seven size groups – from 1–5 mm to 31–35 mm. The maximum size *Dreissena* on *Unio* from year to year increased on the average from 26.1 mm in 2005 to 31.1 mm in 2009.

A character of the dependence length – biomass for Unionidae during period of researches is close to results cited in the literature and received in natural conditions (Alimov, 1981).

In 2005 (first, aggressive period of invasion) the prevalence of *Dreissena* biomass over Unionidae biomass was registered, but in 2006–2009 the *Dreissena* biomass in a cooling pond has decreased and basically did not exceed biomass of *Unio* that can testify to some stabilisation of settling processes and joint dwelling of two species of molluscs-filtrators.

After beginning work of the second block of the Khmelnitskiy nuclear power plant and invasive *D. polymorpha* in a cooling pond some reduction of Unionidae populations was noted, Molluscs *Anodonta* have disappeared in all cooling pond, abundance of two species *Unio* were reduced a little. One of substrata on which settlements *Dreissena* are formed is Unionidae shells. In the first years after *Dreissena* installation its biomass on live Unionidae was in 1.5 times above, than biomass of the carrier, further this ratio has decreased to 0.5–0.7. Analyzing the morphometric indicators for shells and the ratio biomass/length for live Unionidae after *Dreissena* installation it is impossible to draw a conclusion on negative influence *Dreissena* on Unionidae in the given reservoir.

Thus, our researches have shown, that registered earlier Unionidae have not been found only in the intake channel of cooling pond of KhNPP after invasion of *D. polymorpha*. In the conditions of a cooling pond, the complex of others biotic and abiotic factors influences on molluscs: high temperature, silting of bottom and considerable development of bottom filamentous algae. However, the obvious negative influence which could be expressed as mass Unionidae mortality in cooling pond of KhNPP has not been noted.
MATERIALS ON ADVENTIVE FLORA OF THE SURA RIVER BASIN

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The Sura is a right-shore tributary of the Volga river, 841 km of length. The basin area is 67, 5 sq. km within Saratovskaya, Penzenskaya, Ulyanovskaya, Nizhegorodskaya districts, Mordovia, Chuvashia, Mary El and Tatarstan.

1621 species of vascular plants were revealed in the basin flora, including 456 (28%) of adventives ones. Of the adventive species the most prevalent are Compositae, Gramineae, Cruciferae, Rosaceae, Chenopodiaceae, Fabaceae.

Recently Hordeum bogdanii, Lolium persicum, Chaerophyllum aureum have been revealed. The «nucleus» of the adventive flora is composed of 32% species (36 agriophytes and 111 epeophytes). Xenophytes are dominant of the adventitious means of spreading, deliberately brought ones comprise 39%, 8% belong to a dual type. Most of the adventive species have come from Asia, The Mediterranean area, America.


Sorbaria sorbifolia, Amelanchier spicata, Galega orientalis, Hippophaë rhamnoides, Elaeagnus angustifolia, Solidago gigantea tend to decolonize. Quarantine species Solanum cornutum, Acroptilon repens, Ambrosia psilostachya have occupied a limited area so far; it is likely that they fail to through the whole development cycle under our conditions.
FUTURE OF BALKHASH PERCH (*PERCA SCHRENKI*) SURVIVING AFTER INTRODUCTION OF ALIEN SPECIES TO BALKHASH-ALACOL BASIN

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Balkhash perch has a “network” of forms: pelagic form is fast-growing, fattening on open biotopes and spawning in rivers, large and predatory form; coastal form is fattening and spawning in thicket biotopes, eats benthos, includes a wide range of morphological types and ecological morphs which are diverse in color, fertility and growth speed; and river form is fattening and spawning in rivers, is characterized by low variability in fertility and growth speed and is a benthofage and a facultative predator.

As acclimatization process went on, pelagic form was eaten by pike perch. Bream and carp are trophic competitors with adult perches, young commercial and trash fishes compete with young perches. For coastal form, crucial carp and roach are strong trophic competitors. River form is the least subjected to acclimatization.

The below factors contributing to Balkhash perch survival:
- high water mineralization and large area of thicket biotopes, preventing numbers and habitats of pike perch and bream from increasing;
- river dams, which act as an unsurpassable barrier for acclimatized species;
- fishing which stops increase in numbers of introduced fish species.

All the above-listed forms of Balkhash perch are a common genetic pool with phenotype implementations reacting to environmental conditions. The forms, each of which inhabits its own niche, increase probability of surviving for the whole species. The only “weak chain” is spawning of pelagic and coastal forms on shallow desalted parts of the lake where young Balkhash perches are eaten by pike perches and compete for feeding objects with bream.
Many Russian reserve floristic lists prove that existing territorial protection organization does not provide natural ecosystem resistance to alien plants invasion.

The Voronezh Reserve illustrates it (according to 1.01.2010):

- The protection period – 83 years, total area – 31 053 ha.
- The total number of vascular plant species is estimated at 1019, of them 149 (14, 6 % of the total) are introduced species.
- 87 alien species have been registered since the reserve foundation.
- 24 species have arrived unintentionally, 30 species have been released deliberately into the wild, and 33 species have escaped into the wild from cultivation. The peculiarity of modern invasions is increasing the number of ornamental and horticultural species escaped from cultivation.
- 40 species (26.8 % of the alien flora) have naturalized in the reserve plant community, 16 species are the potential members of the protected ecosystems. Some exotic plants have become the food for indigenous birds and animals that spread their seeds over the territory.
- The plant communities’ structure transforming by naturalized alien species has already been registered in the Reserve.

Being the country that signed the Convention on Biodiversity in 1992, The Russian Federation has to “prevent the introduction of alien species that threaten ecosystems, ecotopes or species, to control or eliminate such alien species”. However, till now in Russian protected areas system alien species invasions are not considered as a problem requiring decision and working out measures on control and management of the process.

How long shall we monitor the biological contamination of protected areas? What other proves needed to begin real actions on conservation local flora and vegetation in the Russian reserves?
In April 2006 thirty Wood Bison were delivered to Central Yakutia from Elk Island National Park of Canada. Four animals died during the first three years. The first 6 calves were born during the spring of 2008. At present, the herd includes 32 animals. The Wood Bison preserve, which occupies the total area of 39.5 ha lies in the territory of Lenskie Stolby National Park that is distanced 120 km away from Yakutsk. Since May 2008 we have been studying the adaptive ecological characteristics of Wood Bison. The animals were observed grazing 3-5 times a day. The average duration of grazing was about 95 minutes. The daily intake of fodder was up to 54.6 kg. The average length of daily trip made by bison was 3816.6 ±355.4 m, the grazing coverage was 2366.7 ±197.8 m. The average duration of grazing was 6.4 ±0.46 hours, while the duration of resting was 5.1 ±0.43 hours. The transition from resting to grazing was faster than that from grazing to resting, which lasted for about an hour and a half. Bison willingly consumed woody and shrubbery plants, thereby damaging lower parts of trees and boscage. In general, the Wood Bison was unpretentious to the fodder conditions.

Bison are social animals therefore they tend to aggregate into herds. But there is no any obvious leader. The greatest social distance was observed between males, while the lowest one was registered between calves as well as between males and calves. Males tended to occupy the periphery of the herd in order to protect the herd in case of danger.
New fish species penetrate into Karelia’s water bodies in several ways. Of special interest is the study of casual, unexpected fish species, such as Syamozero smelt, in water ecosystems. The smelt *Osmerus eperlanus* (L.) was first reported from Lake Syamozero in 1968. After penetrating into the lake the smelt population has passed through several stages.

At stage I (1968-1977), the population was growing in abundance. In 1977, thirty tonnes of smelt were caught. Smelt abundance is, of course, only indirectly reflected by catches.

Smelt was most abundant at stage II (1978-1980). In 1980 its catch was as high as 185 t, which is equal to annual fish catch from the lake in 1960-1970. Growth in abundance was facilitated by favourable feeding and spawning conditions. As smelt catches on Lake Syamozero increased, catches of fish of the *Coregonus* family decreased (105-0.015 t). Smelt has actually made vendace and whitefish less abundant by eating their larvae.

At stage III (1981-1989), smelt abundance decreased considerably and catches dropped to 20 t. All the changes observed were probably caused by the infestation of smelt with a parasite of the genus *Glugea*. In 1981 infestation increased to 100%. The parasite of the genus *Glugea* can cause parasitic castration.

At stage IV (1989-2002), smelt catches stabilized at 50 t/year, the degree of infestation decreased. At stage V (2003-2009), smelt catches decreased to 2 t/year and vendace catches increased to 43 t/year. At present, the main stream of substances and energy in the lake continues to move along the planktonic pathway, but smelt is now replaced by vendace. Further studies on the lake are expected to show what will happen to the smelt population in Lake Syamozero.

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THE LONG-TERM DYNAMICS OF POPULATION CERCOPAGIS PENGOI (OSTROUMOV) IN EAST PART OF GULF OF FINLAND

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Predatory Cercopagis pengoi (Cladocera) has been recorded in the east part of Gulf of Finland since 90th years of 20 centuries. The long-term fishery monitoring have been included the investigation of a zooplankton community. This investigation has been conducted by the State research institute on lake and river fishery (GosNIORKH) in the all east part of Gulf of Finland with the second-order bays and with shallow- and deep-water areas.

In seasonal aspect C. pengoi is characterized as the summer form. It has appeared in plankton in June – July. In warm years this species has been occurrence in the end of May. The maximum of C. pengoi have been registered in June – August, but in warm years many specimen have been caught in September. In autumn (October) individuals have been very scarce.

The distribution of C. pengoi in the east part of Gulf of Finland has not been very homogeneous. The maximum abundance of species has been in deep-water, brackish-water parts of Gulf of Finland. But sometimes individuals have been registered in the fresh-water areas. The individual of this species has been noted in Neva Bay (the south Lahta sandbank, near dam of S-Petersburg flood control).

The density of C. pengoi often has not been very big. In 1997-2009, in shallow-water part of Gulf of Finland it has varied from 10 to 80 ind./m$^3$ (2-5% of all density of community). Analogous part of community this species has made up in Koporsk and Luga bays and Vyborg gulf. On same deep-water stations and in deep-water region of Gulf of Finland the density of C. pengoi has been too much. At mean it has been 200 - 300 ind./m$^3$ (maximum - 1300 ind./m$^3$).

The part of C. pengoi in all density of communities in these sites has increased to 10–30%, with maximum near city Primorsk.

The biomass of C. pengoi has greatly varied. In 1997-2001, in shallow-water area of Gulf of Finland it has consisted from 1 to 50 mg/m$^3$ (≤ 17% of total biomass of community). In 2007-2009, biomass this species have decreased from 2 to 20 mg/m$^3$ (≤ 3% of total). In the deep-water area in 1997-2001, the biomass of cladocerans has consisted 40-50 mg/m$^3$ or 15-36 % of total. In the Vyborg Gulf the biomass has consisted from 10 to 13 mg/m$^3$ or 4% of total by 2001 and has not almost changed with time. In the strait Berkezund in 1997-2001 the biomass of C. pengoi has varied from 520 to 960 mg/m$^3$ (16-74% of total), and since 2005 it has decreased from 10 to 200 mg/m$^3$. In the Luga bay the biomass has varied from 220 to 400 mg/m$^3$ (≤ 20% of total) by 2001, and in 2006-2009 it has consisted from 34 to 130 mg/m$^3$ or 10-35 % of total and in 2007-2009 - from 2 to 70 mg/m$^3$. The part of C. pengoi in total biomass on the biggest part of water area has not exceeded 5%.

The maximum of density and biomass of C. pengoi has recorded since 2000 to 2005. In the next years the density and biomass have decreased in absolute and in relative value.

In total abundance of C. pengoi has showed the recessionary tendencies, but some-times the maximums of its abundance have recorded in 2007 in Luga bay (260–3878 mg/m$^3$).

C. pengoi has been active consumed in June and August by sprat, smelt, whitefish, perch, roach, bleak, bream.

The sprats have been basic commercial species in east parts of Gulf of Finland. Last decade, the C. pengoi has been major component of forage of the sprat from July to October. In 2004 in the last ten days of May the C. pengoi has been registered in stomach of sprats in Koporsk bay.

In Luga bay in 2000-2007, the maximum part of the C. pengoi in stomach of sprats have been registered in 2000. Its part in ration of sprats has varied from 25% for underyearling to 90% for elder fish. The importance of C. pengoi in food of sprat has partially decreased and its part in food of fish have consisted no more than 73% since 2001.
Modeling of gene frequencies dynamics in the Volga kilka populations under influence of the factor natural selection is spent. It is established, that inversion of frequencies of two-allelic locus, observed in a real situation, at action only the factor of natural selection, can theoretically descend and in an historical (ecological) time scale. At the directed selection for $2 - 54$ generations are observed inversion of frequencies, and further transition to a limiting state $p_\infty = 1, q_\infty = 0$. One trajectory of system which for long time can lead to observable distinctions is noted only. However, the minimum changes of relative fitness homo- and heterozygotes lead to limiting states $p_\infty = 1, q_\infty = 0$ or $p_\infty = 0, q_\infty = 1$.

In the case relative adaptiveness of heterozygotes over homozygotes in itself without influence of other evolutionary factors for the period $4 - 23$ generations results selection from a state corresponding to a habitation in the sea to a balance of equilibrium of freshwater kilka populations Upper Volga reservoirs.
ABOUT THE INTRISTIC GROWTH RATE OF KILKA CLUPEONELLA CULTRIVENTRIS (NORDMANN,1840) POPULATIONS IN THE RESERVOIRS CONDITIONS

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The population growth rate in the absence of limitation is constant, maximum for the given conditions and characterises hereditary ability of population to growth. Such situation often arises in the first years after appeared species in new water body. It is known, that in fish invader populations in Volga and Dnepr reservoirs the morphological and genetic changes are noted. Therefore the information on the maximum specific growth rate of population invaders in new conditions is important for the decision of many theoretical and practical problems of ecology of invasions by animals. The purpose of this work is the comparative analysis of the intrinsic growth rate reservoir’s kilka population.

Settling process of kilka in Kahovsky, Kremenchug, Kuibyshev and Rybinsk reservoirs is analysed. In places of creation of three last reservoirs kilka before formation did not meet. The estimation of growth rate of number of population kilka Kahovsky, Kuibyshev and Rybinsk reservoirs is based on data research pelagic trawl. Calculations on relative change of a biomass kilka population the Kremenchug and Kahovsky reservoirs are spent on the basis of dynamics trade catches. For the investigated water bodies the maximum (the intrinsic) growth rate of kilka population number was in limits 1-5, and the maximum growth rate of a population biomass 2-3. The tendency of decrease of the given indicator is noted at advancement invader on the north and decrease of an abundance of a zooplankton.
SETTING UP A FRENCH ALIEN INVASIVE SPECIES NETWORK

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In response to the First Grenelle of environment, which is a law that sets ways to management issues related to the environment and sustainable development, France is on the verge of achieving its national strategy on invasive alien species (IAS).

For this issue, the Ministry of Ecology (MEEDDM) has delegated two technical coordinators, the National Museum of Natural History (MNHN) and the French Federation of National Botanical conservatories (FCBN). The MNHN is in charge of the invasive alien fauna side and the FCBN of the invasive alien flora side.

Several missions have been entrusted the following structures:

1. Developing an early warning system along with the surveillance of the national territory including outermost regions. The strategy is coordinated at the national level.
   - Firstly to undergo a review of experiences which are occurring or have occurred in other countries or regions, especially those of similar ecosystem. This will lead to the identification of species that need to be specifically watched, like the grey squirrel, *Sciurus carolinensis* Gmelin, 1788 [Rodentia : Sciuridae], in Italy;
   - Secondly, to implement an early detection and rapid response system. This allows identifying local people who have or can provide technical knowledge as well as capacity of detection and others who can act rapidly. Between detection and action, appropriate time will be taken to evaluate the situation and the best answer to be given (regarding effectiveness, costs and benefits, appropriate level of action etc.) Detection is already running on the field and public services, which recently alerted public services or the Ministry of Ecology, are notified of the presence or the suspicion of any new alien species. A number of initiatives are taken locally (to build up early warning systems) and need to be coordinated at regional and national scales. A national database will be built and filled in with the names of species currently introduced in natural environments of the country and the others that have to be watched over. About cooperation of control measures across national boundaries, the European Strategy (including United Kingdom, The Netherlands, Spain and France) on the ruddy duck *Oxyura jamaicensis* (Gmelin, 1789), [Anseriformes : Anatidae] will be reviewed in 2010. Cooperation is already effective for this species.

2. Establishing a network of experts nationwide
   Before setting the network, an inventory of the existing programs, researchers, public institutions that are already working on the IAS subject. The lacks and needs of this pre-existing system are also listed. The FCBN and the MNHN is building a functional pattern with an expertise group (which will includes mostly scientists), a management team, a watch and warning group and finally a communication group.

3. Identifying of priorities for the management of IAS that have a “negative impact” on biodiversity
   The technical coordinators have to make different IAS lists, for management and for regulation and control. A methodology for making IAS lists and priority species is being studied.

4. Monitoring and assessing integrated indicators for the management adopted

5. Developing a communication component
   A communication group has to be created for a good information exchange within the network as well as for informing and raising awareness of the public. The MNHN and the FCBN are currently working to define each group functions and members.

6. Making a synthetic study to clarify the concepts of invasive species, invasive, native species and foreign species regarding the French semantics.
Could biotic invasions influence flor- and faunogenesis’ trends, new biogeographic borders’ development in Northern Eurasia? To answer these questions one has to believe that biotic invasions can be a cause of the irreversible reorganization in biotic complexes, and that invasive species can penetrate to the regional successional systems, block achievement of climax stage, create new ranks of successions, enlarge and reduce floristic and faunistic complexes’ composition by forming “secondary areas” inducing biogeographic borders’ removing.

The analysis of the maps of the various groups of organisms’ (birds, mammals, several families of insects) areas was done for revealing the simperates as the basis for determination of contemporary biogeographic borders of species areas in Northern Eurasia. The same analysis, for example, comparing of the maps of mammals areas’ reconstruction for the 18th century and for the 20th century shows increasing of simperates’ continuum and appearing of new “borders’ concentrations” of species’ areas. So we can speak about necessity of revision of the actual biogeographic zonation.

The phenomenon of physic-geographic borders’ destruction for transmeridional and translatitudinal migrations of plants and animals species takes place in many regions with historical biogeographic borders (the Greater Caucasus, the mountain of Southern Sibiria and Southern Far East). In the same time biotic invasions formed new simperates there and favored appearing of the new nature and anthropogenic borders of species areas. It should be the signal for rectification of the regional biogeographic zonation.
SEED PRODUCTIVITY OF \textit{GALEGA ORIENTALIS} IN POPULATIONS OF VARIOUS NATURALIZATION STAGES

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Natural distribution range of \textit{Galega orientalis} Lam. - Caucasus and Transcaucasia. In 1920th this species grew up as melliferous and silage culture in Baltic and tested in Moscow suburbs. In spite of \textit{G. orientalis} is invasive species in many regions of the Eastern Europe (Estonia, the Ivanovo, Vladimir, Kaluga, Moscow, Novgorod and Penza districts, Mordovia), perfection of its cultivation proceeds, and it suggest to use for biological recultivation the urbanised territories.

Seed productivity is under investigation in 4 populations of various naturalization stages.

Population N1. Smolensk district, Kardymovsky res., village Schokino, selection nursery of Smolensk agricultural station. The cultivar testing plot was put in 1998 from seeds, collected from the plants which are running wild in the next area about 1970th (data of 2003); On generative shoot there are from 8 to 148 beans (the average 32.1±8.8). Each fruit contains from 0 to 8 mature seeds (the average 1.6±0.1). Thus, alone generative shoot forms 50.7±11.8 (11-170) mature seeds.

Population N2. The same plot after the ending of experiences on cultivar testing; population is naturalized within 3 years (2006-2009). On generative shoot there are from 93 to 159 fruits (114.6±27.8). Each fruit contains from 0 to 10 mature seeds (3.4±2.4). Thus, alone generative shoot develops 393.2±195.3 (172-709) mature seeds.

Population N3. Smolensk district, Hislavichsky res. The neglected field of collective farm "Bolshevik", on which \textit{G. orientalis} was sowed in 1994 and subsequently did not cultivate; population is naturalized within 15 years. On generative shoot there are from 1 to 31 beans (17.9±8.5). Alone bean contains from 0 to 9 mature seeds (2.9±1.9). Thus, there are 52.6±29.5 (4-120) mature seeds per generative shoot.

Population N4. Moscow, Main botanical garden RAS. Plants were grown up on an exposition of Caucasus flora from the seeds collected in 1949 in Kabardino-Balkaria (Nalchik district, the mountain “Lycaya”, 1100 m above see level, a meadow). About 20 years ago plants "have run away" from an exposition, forming naturalized population. On generative shoot there are from 53 to 93 fruits (an average of 70.2±14.2). In each bean there are from 0 to 7 mature seeds (1.9±1.3). Thus, alone generative shoot forms 130.2±51.3 (25-186) mature seeds.

Direct correlation between number of fruits and number of seeds is noted. Individual variability on fruit number is high and very high (Mamaev, 1969); in population N1 CV=108\%, in populations N2 and N4 CV=70 \%, in population N3 CV=65 \%. Individual variability on seeds number is high and very high too.

The populations N3 and N4, having the lowest seed productivity, extend especially for the vegetative growth of plants. In whole correlation between duration of the period of naturalization and seed productivity of the studied populations is not noted. Nevertheless, population N1 had much more low seed productivity than populations N2 (in 8 times!), and this phenomenon points out the trend to increasing of seed productivity of \textit{G. orientalis} during naturalization process.
INVASIVE POTENTIAL OF ADVENTITIOUS PLANTS AT THE MIDDLE URAL

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At the Middle Ural have been described 328 adventive species of vascular plants. Main part of it presented in the urban flora – 299 species. 138 species grows along railways and 83 in agrophytocenoses. 41% of the adventive plants is not aggressive – epecophytes – and all of them penetrated at the Middle Ural accidentally – xenophytes. Second large group is ephemerophytes (27%) and 60% of them is ergasiophytes. They mainly grow in towns (26%) and along railways (23%). Close to them, according number of a species, group are forming by colonophytes (26%), biggest part of them is introduction plants.

Most aggressive species is agiophytes, group consist of 18 species vascular plants. 78% of the agiophytes belong to xenophytes and 22% to introduction plants in past. 13 species of agiophytes is invasive plants: *Heracleum sosnowskyi, Artemisia absinthium, Conyza canadensis, Impatiens grandulifera, Bunias orientalis, Chenopodium album, Convolvulus arvensis, Echinocystis lobata, Hippophae rhamnoides, Elodea canadensis, Epilobium adenocaulon, Epilobium pseudorubescens, Amelanchier spicata*. So, at the Middle Ural invasive plants is a minor component of adventive fractions of flora – 4%.

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THE PHENOMENA OF THE BIOTA EXTINCTION IN THE GEOLOGICAL PAST AND NOWDAYS

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In the history of the Earth numerous cases of the mass organisms extinction are noted. But each time, after global cataclysm biota regeneration occurs. The mass disappearance from life arena of organisms often correlates with a cold snap of the climate or with influence of other global factors, for example, collision of the Earth with asteroids, etc. According geologists opinion, the Earth during existence was repeatedly covered by an ice armour in the thickness more than 2-3 km. Duration of boulder-period is estimated by hundreds millions of years. Naturally, in such conditions could remain only the animalcular organisms which existence does not depend on a solar energy directly, for example, components of «black smokers», lithotrophic, etc. But, despite there were breaks in historical biogenesis, biota continues develop again and again, and each time its organisation level become higher in comparison with the previous one.

Any of existing theories of evolution cannot explain authentically the reason of the entropy reduction in the course of evolution, occurrence and fast expansion of taxonomic groups which are not lineal descendants of the previous biota representatives, for example, angiosperms, insects, mammal and other groups of organisms, an orientation of a development vector «from simple - to difficult, from a lifeless matter - to live beings, from the last ones – to the carrier of intellect (person)». Possibly, there is a special, unknown to science, mechanism of evolution, which is based on earth-space unity.

Processes in biosphere were accelerated considerably with the human being occurrence on the Earth. The list of disappeared species replenishes every year. Having begun from the representatives of boulder-period megafauna, human continues to exterminate species deliberately or automatically during 40 thousand years. At the same time, other species have an opportunity to wide expansion thanks to the activity of human. Not only cultivated kinds but also accompanying them species (vermin, weeds, etc.) become usual components of natural ecosystems on all continents, except for Antarctica.

There is a certain quantity of the species which capable to occupy destroyed acres. This migration-mobile group of plants can be included in the group of natural powers of «fast reaction». Their functional role is to guard integrity of natural ecosystems, to appear in places with favorable conditions, where the role of competitors is lower. According to their census value, these are a plants of the mobile substrata, big fires, areas along wild animals tracks and watering points, highways and railways. Such species as Polygonum aviculare L., Innula britannica L., Plantago major L., Dactylis glomerata L., Urtica dioica L., Arctium tomentosum Mill., Chenopodium polyspermum L., Potentilla anserine L. and others are components of the broken ecotopes, which were existing before the agriculture. Development of the husbandry, transport and trade, the industry and other forms of economic activities have led to the reality where biodiversity of adventive species comes nearer to a floristic aboriginal riches.
In recent years, the global warming has provided ideal conditions for the expansion of many southern Ponto-Caspian fish and molluscs through the Caspian-Volga-Baltic invasion corridor. This research showed a low biodiversity of parasites even in the most common estuarial invaders sampled from the northern reservoirs of the Volga River basin, such as the Ponto-Caspian tyulka Clupeonella cultriventris (16 species), tubenose goby Protherorhinus marmoratus (17 species), round goby Neogobius melanostomus (14 species). During 2000 – 2010, only a few examples of increase in prevalence (up to 80 – 100 %) and abundance approximating to epizootic levels were registered for some non-specific parasites. These included the following: three peritricha ciliates Epistilys Iwoffi, Trichodina acuta and Ambiphrya ameiuri on the gills of tubenose goby; the nematode Contraecocum microcephalum and the acanthocephalan Pomphorhynchus laevis from the round goby; metacercariae of trematodes Bucephalus polymorphus and Apophallus muehlingi from muscles of tyulka. In some water bodies, there is a tendency of decrease in prevalence of Bucephalus polymorphus after partial replacement of zebra mussel Dreissena polymorpha (unique first intermediate host) with new alien species D. bugensis (quagga mussel). On the contrary, the number of the populations of the alien snail Lithoglyphus naticoides increased rapidly in the recent years. A simultaneous increase in prevalence of parthenites Apophallus muehlingi in the first intermediate hosts was observed: up to 70.0% in the Upper Volga versus 34.5 % in the Middle Volga. An increase in glycogen content (20 – 40%) in the muscles of aboriginal fish was noted following their infection by the metacercariae A. muehlingi in the experimental environment. The hyperinfected fishes with low mobility after destruction of their muscle structure by metacercariae will be more vulnerable prey for birds as definitive hosts of A. muehlingi, and by carnivorous fish.

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UNCOVERING OF THE ALIEN SPECIES AND THEIR DISTRIBUTION IN ODESSA AND ODESSA REGION

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During 25 years we investigated changes in flora Odessa and some districts of Odessa’ region. In so named “critical zones” (Mosyakin, 1996), in the streets and parks there were found more than 50 species, new for city or region. For example, Amsinckia calycina (Moris) Chater (Boraginaceae) was discovered by us in Odessa trade port in 1993 and don’t go to its bounds. At the same territory in 1989 firstly was founded Euphorbia dentata Michx. Then that species diffused not only on Odessa trade port territory but in the South Bessarabia. In port territories were founded Ipomoea hederacea (L.) Jacq.(Convolvulaceae), Eragrostis cilianensis (All.) Vign.-Lut., Panicum dichotomiflorum Michx. (Poaceae) etc. Last species was met and in South Bessarabia. Though they led them as kolonophyte, those species had a big potential danger. Acalypha australis L. (Euphorbiaceae) firstly was founded in Odessa on Shevchenko Avenue. Next this species diffused in different ecotops of Odessa and then was founded in Cherson and Sympheropol.

In region there were displayed species, which have potential danger for this zone. Especially danger invasively active species are Ambrosia artemisiifolia L., Cenchrus longispinus Benth., Solanum cornutum Lam. About distribution of ambrosia now we can see from our analysis of cargo, which imported and exported in region through quarantine inspection. Twenty years ago on Odessa city territory ambrosia met near airport and on the railway. Additional source of ambrosia appearance were imported loads. The most quantity of ambrosia appeared with different loads from Moldova. The dirtiest were loads of maize from different European countries. Presences of ambrosia in loads from different region of Ukraine, which go for export through Odessa port, show us, that this species, to our regret, is inherent practically for all regions of country. The main agriculture culture to be litter by ambrosia is sunflower. Then follow wheat, barley and other culture. Similar results may be not in such scale, we can wait from spreading another alien species as, for example, Euphorbia dentata.. Some of alien species form hybrids with aboriginal species, as for example, species of genus Xanthium.
INFLUENCE OF INVASION BIDENS FRONDOSA L. ON NATIVE BUR-MARIGOLDS

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Studying of seed germination and sprout developments of native Bidens tripartita, B. cernua, B. radiata, alien North American B. frondosa and hybrid B. x garumnae (B. frondosa x B. tripartita) have shown that on speed of the initial ontogenetic stages a following increasing number is built: B. cernua → B. x garumnae → B. radiata → B. frondosa → B. tripartita, and on rates of a biomass gain – B. x garumnae → B. cernua → B. radiata → B. tripartita → B. frondosa. In spite of the fact that B. frondosa blossom after all other bur-marigold species, it are in time for the short period (within 1–2 weeks) to finish flowering and to give seeds. In the end of the vegetative period (August) in places released others plants first of all there are B. frondosa which often blossom already in virginal state (the phenomenon of neoteinia), that it is possible to explain dependence of development generative bodies from periodicity of illumination. It explains why in the mixed plantings B. frondosa sprouts suppress development of sprouts of other bur-marigold species that in turn explains so active distribution of invasion species. Thus it is established that because of the increased rates of development, high production parameters and change during ontogenesis a life strategy of sprouts with explerent on violent, invasion species Bidens frondosa supersedes native species B. tripartita. In summary intensive natural hybridization the given native species is absorbed by alien. Investigation is supported by grants of the fundamental researches Programs of the Russian Academy of Science «Biodiversity» and «Biological resources of Russia».
Tyumen - an administrative centre of the Tyumen region. In city gardening 120 kinds of wood plants, from them nearby 50 - wood forms and 70 – bushes. In a city is 45, local kinds of trees and bushes, 75 kinds and versions it is presented introduced species

Most often in city gardening, there are such kinds drevesno-kustarnikovoj vegetation as: 


At introduchin these plants in territory of Tyumen there are changes in terms of approach of those or other phenological phases, in comparison with their natural area of dwelling.
DIFFERENCES BETWEEN SOLIDAGO CANADENSIS, S. GIGANTEA AND S. GRAMINIIFOLIA IN TERMS OF ANATOMIC CHARACTERS OF THEIR LEAVE BLADES

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Three North American species of genus Solidago were picked up as a subject of this study. Two of them (S.canadensis and S.gigantea) are closely related (even presenting difficulties while identification) and classified among most actively invasive plants of Europe, while S.graminifolia is known in Europe only in cultivation and could be easily distinguished from those two species in linear leave blades.

The following local populations were investigated during the study:
- S.canadensis: Slovakia (Banska Bystritsa, within the city limits), Czech Republic (Brno, within the city limits), Hungary (Budapest, within the city limits);
- S.gigantea: Slovakia (Banska Bystritsa, within the city limits; along the left bank of Danube at the stream level, 12 km to the east of Komarno; the left bank of Danube, within higher river-flood terrace, at the road N 63 embankment, 17 km to the east of Komarno), Czech Republic (Brno, within the city limits);
- S.graminifolia: Czech Republic, Brno, the University Botanical Gardens.

All the species are characterized by adaxial stomas, 5-10 % larger, than the abaxial ones. S.canadensis has the largest stomas (average length (l) of adaxial stomas = 33.0, and average width (d) = 17.5 мк; abaxial stomas l = 31.4 and d = 15.9 мк). S.gigantea’s stomas are smaller (adaxial stomas l = 31.6 and d = 19.0 мк; abaxial stomas l = 27.6 and d = 18.6 мк). S.graminifolia has the smallest stomas (adaxial stomas l = 28.8 and d = 19.9 мк; abaxial stomas l = 26.6 and d = 22.6 мк).

Each of the three species is characterized by the stomas of different shape. The most elongated stomas are recorded for S.canadensis (l/d = 1.93 for adaxial stomas and l/d = 1.99 for abaxial ones). In two other species adaxial stomas are more elongated than abaxial ones. So, S.gigantea has l/d = 1.68 for adaxial stomas and l/d = 1.49 for abaxial ones, and S.graminifolia has l/d = 1.46 for adaxial stomas and l/d = 1.21 for abaxial ones.

These species differ also in total number and a proportion of adaxial and abaxial stomas in microscope field. S.canadensis has parity: in average, there are 11-12 stomas both on the adaxial and abaxial sides of leave blade. S.gigantea has 12 adaxial and 7 abaxial stomas (ratio 6:4) in microscope field. Quite a different pattern is found in S.graminifolia: it has 17 adaxial and 23 abaxial stomas (ratio 4:6) in microscope field. S.graminifolia differs from two other species not only in a greater number of stomas (1.5 times), but also in presence of the specific glands on both sides of leave blade.

Thus, size of stomas, their shape, total number, and a ratio between abaxial and adaxial stomas are the additional diagnostic characters within alien widespread Solidago species.
MOLECULAR DIAGNOSTIC SYSTEMS TO DISCRIMINATE DREISSENA POLYMORPHA (ZEBRA MUSSEL) AND DREISSENA BUGENSIS (QUAGGA MUSSEL)

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Taxonomic keys based on traditional shell morphology are not always able to differentiate Dreissena polymorpha (Pallas, 1771) or Dreissena bugensis (Andrusov, 1897) and their hybrids (Grigorovich et al. 2008, Voroshilova et al. 2010). Thus, sometimes molecular markers are necessarily using to identify dreissenids.

For this purpose species-specific protein-coding loci (phosphoglucomutase PGM-1*, malate dehydrogenase MDH-2*, inorganic pyrophosphatase PP*) was found (May and Marsden 1992; Spidle et al. 1994; Spidle et al. 1995; Voroshilova et al. 2010). Moreover, DNA-based markers are using for identification these species. Previous investigators applied RFLPs analysis (endonucleases NlaIV, DraI, Rsal for CO I mitochondrial DNA, and HinfI, HaeIII, Rsal for nuclear ribosomal RNA gene 28 S) and species-specific amplification nuclear ribosomal RNA genes 18S, 28S (Baldwin et al. 1996, Therriault et al. 2004, Frischer et al. 2002, Hoy et al. 2010).

However, in restriction sites and fragments for annealing species-specific primers mutative changes are possible, which will decrease diagnostic value of this markers. In this connection, the aim of our work is analysis of infraspecific nucleotide polymorphisms of dreissenids. In that work mitochondrial DNA (CO I, Cyt b, 16S), and nuclear ribosomal RNA genes (18S, 28S) was analysed (more than hundred nucleotide sequences in the NCBI database).

As a result was shown that amplification with species-specific primers is not always able to differentiate D. polymorpha, D. bugensis or theirs hybrids with confidence. Combination of nuclear with mitochondrial DNA restriction digests or mitochondrial DNA restriction digests with allozyme analysis is more surely.
Reproductive control in wildlife species who come into conflict with humans has received increasing attention as a humane method for managing wildlife populations. Moreover, modeling studies show that contraception as a tool to management populations is best suited for species with high population turnover, i.e., short generation time and high reproductive output. Thus, rodents are ideal targets for this management tactic. In addition to agricultural losses, human health and safety from rodent transmissible zoonoses are of concern. Zoonoses attributable to rodents are exacerbated during periods where their population erupt. Methods that can dampen these irruptive population cycles would prove highly desirable. It is our goal to develop a product that will dampen the amplitude of these rodent population cycles. We examined the influence of predator chemical cues derived from predators on reproductive output of rats, mice and voles. Animals responded to predator chemical cues with suppressed reproductive output. A number of active compounds from predator scents have been detected and tested under laboratory and semi-natural conditions. In current study we examined the influence of potential pheromone of *Felis catus* L-Felinine (US Biologicals) on reproductive output in House Mouse and Norway rats. Both, mice and rats showed seasonal sensitivity to L-Felinine. L-Felinine affected significantly (p<0.001) survivorship of offspring. We now present evidence to support this observation.
THE TRANSFORMATION OF ICHTHYOFAUNA IN WESTERN SIBERIA DURING LAST CENTURY

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This report presents an overview of fish complex in the context of global change of climate and different type of human economical activity in Western Siberia by the example of Ob River basin.

Vast territory of Western Siberia is characterized by different conditions of climate and landscape. In fact three sections of the river are the self-depended systems. Upper Ob is located on the areas of the mountain and step zones, Middle Ob is situated within forest and taiga zones, the territory of Low Ob are tundra and arctic zones. So the fish communities vary in different parts of the river accordingly.

To the beginning of XX century fish complex included 14 species from European regions, 14 returned from Arctic zone, 5 – from East Siberia, 2 – from Mongolia and 6 migrated from Far East. During XX century 8 new species from Europe (6) and Far East (2) enriched the native fauna. Moreover, some exotic fishes from Central Asia, North America and even Kamchatka peninsula adapted successfully in conditions of artificial ponds. Before 1950 fish diversity increased by 6 %, between 1950-1980 amount of alien species composed 23 %, and to the beginning of 2000 - 38%. Aggressive tactics of some alien species as Perccottus glenii Dybowski, 1877 and Sander lucioperca (Linnaeus, 1758) have an effect on fish composition and food webs of water ecosystems.

The climatic changes are important reason of ichthyofauna transformation. For example, the distribution of introduced species - Abramis brama (Linnaeus, 1758) and Sander lucioperca - along river system could be interpreted as process of adaptation in new conditions of region. However widening of spatial distribution by some objects of native fauna - Tinca tinca (Linnaeus, 1758) and Gobio gobio (Linnaeus, 1758) - over the Ob basin for the short time demonstrates us essential changes of the environment.

It could be suggest various reasons to understand the existent situation. They are human activity, high level of adaptive facilities of species and global environmental changes. Fish-breeding, evacuation of warm water by industrial complex to natural streams and dams are able to destroy the natural fish populations and it could negatively impact to the region totally.

Now there are urgent questions to investigate spatial organization of fish populations, specific of fish community in the divided parts of the river and the genetics state of fish populations to accumulate data about dynamics of structure and organization of biotic complex in the environmental changes.
In upper reaches of the Kuybyshev Water Reservoir (upper of the Ulyanovsk Region up to dams of Cheboksary and Nizhnekamsk hydroelectric power stations), in a total 277 taxa of benthic invertebrates were revealed (212 – with rank below a genus). Number of the alien species is totaled 30 – basically the representatives of the Ponto-Caspian fauna complex (Yakovleva, 2010; Yakovleva, Yakovlev, 2010).

Seasonal changes. Occurrence and quantity parameters actually of all invasive species in the qualitative samples collected by means of a hand net on shallow shore areas are minimal in June – during a maximum water level. Since June, in process of decrease in a water level, occurrence and abundance of the zebra mussel *Dreissena polymorpha* (Pallas 1771) are increased. Quaqqa mussel *Dreissena bugensis* (Andrusov, 1897), inhabiting in deeper parts, starts to meet in samples more often only during the autumn when deeper sites of the water reservoir are drained. Gammarids are rather abundant in the summer. The total contribution of all alien species in a total number and a biomass of zoobenthos exceed usually 50%. Dreissenid mussels remaining on a land during this period perish or are eaten. Mobile invertebrates migrate into deeper areas or bury in a ground.

Invertebrates in deeper parts of (depth <5 m at a normal retaining level) do not subject to direct negative effects of decrease in a water level. On the contrary, they are enriched by invertebrates, migrating from the shallow areas. Quantity of invasive species there are minimal in the summer, especially in June.

Long-term changes. Frequency of occurrence of invasive oligochaete and mollusk species on shallow areas increased in 1998–2008. On the contrary, crustaceans were characterized by the opposite tendency (ANOVA, *p* <0.02). Corophiids were not found in 2007-2008. Biomass of mollusks *D. polymorpha* (Pallas 1771) and *Lithoglyphus naticoides* C. Pfeiffer, 1828, mysids and gammarids also were significantly (*p* <0.04) decreased during this period. On the contrary, abundance of *Dreissena bugensis* (Andrusov, 1897) has increased during this period approximately in 4 times (*p*=0.0007), that, possibly, confirms its further distribution in the water reservoir. Frequency of invaders occurrence in grab samples decreased by 2008, except for *D. bugensis* and *L. naticoides*. So, frequency of occurrence of *D. bugensis* has reached up to 70%, by 2007–2008, and *L. naticoides* – 60%. All other invasive species showed maximal occurrence in 2001–2002. Number of the majority alien species was reduced, except for *D. bugensis*, which number and biomass have increased in 5.6 and 2.5 times accordingly. The same tendency is found for a biomass of alien species, except for *L. naticoides*, which number increased, but a biomass has decreased. The total contribution of invasive species in a zoobenthos number was minimal in 2001, maximal in 2007–2008

Thus, in conditions of the flat water basin with the high amplitude of a seasonal water level fluctuation, significant changes of structure and abundance of invasive species in benthos communities are characteristic. The minimal values of their diversity, number and biomass on shallow sites are observed during the summer (during the invertebrate’s reproduction). Their abundance increases by the autumn. Migration of the mobile invertebrates in more deep-water zones during the gradual decrease in a water level promotes the rise of their abundance.

Despite of increase in number of mollusk *L. naticoides* during the last decade, its biomass has sharply decreased, that testifies to reduction of their individual weight. Frequency of occurrence, number and biomass only of *D. bugensis* has unequivocally increased, and abundance of the other invasive species and taxonomic groups were reduced.
COMPARATIVE ANALYSES OF DREISSENA POLYMORPHA (PALLAS 1771) AND DREISSENA BUGENSIS (ANDRUSOV, 1897) CONSORTIUMS IN UPPER REACHES OF KUYBYSHEV WATER RESERVOIR

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Based on samples, collected during the last decade, as consortiums of two congenial dreissenid species, Dreissena polymorpha (Pallas 1771) and Dreissena bugensis (Andrusov, 1897), we have examine benthic communities where the share of one or both mollusk species exceeded 50% of a total biomass. In D. polymorpha consortiums has been found out 51 other consort species, and in D. bugensis – 37 and in case of both species together – 77 species. Among the native species in dreissenid consortiums more often were found gastropod Viviparus viviparus, oligochaete Limnodrilus hoffmeisteri, leech Erpobdella octoculata, chironomids Procladius, Chironomus plumosus and Cryptochironomus gr. defectus, among the alien species – polychaete Hypania invalida, gastropod Lithoglyphus naticoides, crustaceans Chelicorophium curvispinum, Dikerogammarus haemobaphes and Pterocuma pectinata. As a whole it is revealed significant (\( p < 0.0001 \)) reduction of number and a biomass of oligochetes in dreissenid consortiums and, on the contrary, increase of abundance of leeches, as well as of the majority amphipod species and C. gr. defectus larvae. Diversity, total abundance and average body weight of invertebrates also were more in samples containing dreissenids. However when the share of dreissenids and, especially D. bugensis, exceeded 50% of a total biomass of communities, i.e. in consortiums, were observed minimal diversity, number and a biomass of other invertebrates. In D. polymorpha consortiums total abundance and biomass of other invertebrates basically were higher in comparison with D. bugensis (\( p < 0.05 \)).

Corophiid Ch. curvispinum was found more often in D. polymorpha consortiums. On the contrary, frequency of occurrence of D. haemobaphes was higher in D. bugensis consortiums (61.5%). Positive correlation between their number and biomass (\( p < 0.01 \)) was revealed. Frequency of occurrence of its amphipod in D. polymorpha consortiums has made only 12.5%. Probably, the reason of distinction consists in that the largest (average length of a its body – 7.3±0.2 mm; 2–17 mm) among amphipods D. haemobaphes prefers consortiums of D. bugensis, differing from other mussel with the larger sizes of a shell. Probably, alive and also empty shells D. bugensis are more favorable for this amphipod as a refuge. For other crustacean species with rather smaller sizes of a body, this factor can not have such value; they often met and in D. polymorpha consortiums which size of a shell is less (ANOVA, \( p < 0.04 \)). Number and biomass of other invasive species decrease in case of the maximal contribution of dreissenids to the total biomass (> 50%), i.e. in consortiums. Significant (\( p < 0.01 \)) positive correlation are revealed between number of D. polymorpha and Hirudinea, as well as with number of V. viviparus, L. naticoides, Gastropoda, Sphaeriidae, Unio, Corophiidae, Gammaridae, Amphipoda and a whole crustaceans. Similar correlations (\( p < 0.01 \)) between number D. bugensis are found only with five taxas (Hirudinea, Viviparus, Gammaridae, Amphipoda, Crustacea). This fact allows to assume, that D. bugensis consortiums are less favorable for other invertebrates (except for D. haemobaphes). It was shown (Scherbina, 2009), that D. bugensis utilizes food more effectively, than D. polymorpha. Possibly, agglutinants and excrements D. polymorpha represent more valuable food for other consorts. Probably, formation of various structures of communities in consortiums of two dreissenid species depends as well as on the different quality of food resources from the two species. Unfortunately, it was impossible to find out data about chemical composition of products of dreissenids vital functions.

Thus, two dreissenids, especially, D. bugensis, during the last five years, dominate and they became the key-species influencing on the structure and function in benthic communities of the Kuybyshev Water Reservoir.
THE DISTRIBUTION AND ECOLOGY OF *DREISSENA POLYMORPHA* AND *D. BUGEINSIS* (*MOLLUSCA: BIVALVIA: DREISSENIDAE*) IN WATER RESERVOIRS AND WATER CURRENTS OF UKRAINE WHEN DWELLING TOGETHER WITH UNIONIDS (*MOLLUSCA: BIVALVIA: UNIONIDAE*)

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In May-October 2008-2009 208 points within the basins of the Dnieper, the Prypyat, the Western and Southern Bug, the Siversky Donets, the Dniester, the lower Danube, rivers of the Crimea and the Northern Azov territory of Ukraine were investigated. *Dreissena* specimens were collected in the silted bottom in case they use living unionidae shells as the habitat substrate. *Dreissena polymorpha* was found in 40 points within the basins with stream velocity under 1 m/s, pH level – 7,62–8,70, water oxygen content – 2,29–48,33 mg/l, permanganate oxidation 1–16 mg/l. Bottom sediments in these points are sandy, sandy-clay, sandy-stony, clay both with small and large quantity of silt. In the latter *D. polymorpha* mostly live on unionidae shells.

*Dreissena bugensis* was found in 13 points (in 12 – together with *D. polymorpha*) in the basins of the Dnieper, the Southern Bug, the Siversky Donets, in the lower Danube, in the Crimea and the Northern Azov territory. It is registered when the stream velocity is under 0,1 m/s, pH level – 7,76–8,70, water oxygen content – 8,20–48,33 mg/l, permanganate oxidation 1–16 mg/l. Bottom sediments in these water-reservoirs are stony, sandy-stony with small amount of silt.

The analysis of obtained results lets to make a conclusion on uneven distribution of *D. polymorpha* and *D. bugensis* in water reservoirs and water streams of Ukraine. The comparison of ecological spectra of these two *Dreissena* species shows high ecological plasticity of *D. polymorpha*.
In the last few decades, the problems of invasive species expansion in ecological systems have come to the fore among other vital problems of environmental protection. Unpremeditated introduction of new species is caused by economic activity that results in unpredictable and unavoidable ecosystem transformation (Biological invasion..., 2004).

The major factors of species distribution beyond the area of their natural inhabitation are navigation, cannel construction and changes in native species habitats. Currently, new incidents of invasive species in aquatic ecosystems of the Ob’ are regularly registered, despite relative isolation of the Ob basin from other river systems, as well as insignificant man-induced transformation of its river systems as against European ones.

Mostly two reasons of the appearance of new macroinvertebrates species in the aquatic ecosystems of the Upper Ob basin (i.e. targeted introduction of economically valuable species and aquarium species invasion) do exist.

The invasion of fresh water shrimps *Gmelinoides fasciatus* (Stebb.) of Baikal origin and Far East opossum shrimps *Neomisis intermedia* (Czerniaewsky) introduced in 60-70s of the last century to the Novosibirsk reservoir to increase the food resources for the fish is referred to the first invasion type. Since 2002, *G. fasciatus* is regularly found in the cooling reservoir of Belovskaya Power Plant (Kemerovskaya oblast'). It probably appeared with juvenile fishes from an aquaculture farm situated in the tail water of the Novosibirsk reservoir. Opossum shrimps *N. intermedia* have spread for hundreds kilometers upstream and downstream the reservoir; they are met in the river and its tributaries from Barnaul city up to the Tom' mouth (Viser, 2006).

The invasion of 2nd type is mainly associated with the distribution of aquarium mollusks in the heated waters of reservoirs. For instance, these are long-term populations of *Pomacea canaliculata* (Lamarck), *Melanoides tuberculatus* (Müller), *Costatella integra* (Haldeman), *Ferrissia sp.*, *Planorella sp.* found in benthic and periphyton communities of the cooling reservoir of Belovskaya Power Plant. The area of their inhabitation is usually restricted to the zones of maximal and moderate heating.

The invasion way of mollusk *Viviparus viviparus* L., widely spread in European rivers and lakes, and met in the Novosibirsk reservoir in early 1990s, is still unknown. This species can be introduced with fish from the European part of Russia or from amateur aquariums. (Andreev et all., 2008). Since 2007, *V. viviparus* dominates by biomass in benthic communities in the mid part of the reservoir.

Regard must be paid to the fact that in aquatic ecosystems of the Upper Ob basin among invasive species 70% falls on mollusks.
THE NEW SPECIES OF PHYTOPLANKTON IN THE NORTH-EASTERN PART OF THE BLACK SEA

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The regular structure of phytoplankton of the Black sea to the present time is studied rather well, nevertheless, new species are found out every year. According to the data of the Odessa demonstration center of Program Globallast there are 29 alien species of the phytoplankton on water area of the Black sea (Alexandrov, 2001; http://www.globallast.od.ua). However by the last results of researches of the Russian and foreign scientists the list of exotic species among phytoplankton become richer.

Some species of the phytoplankton only at the South-Western part of the Black sea and Bosphorus region were noted earlier, where they by sea currents could be brought. Now they are met at the Northern and the North-Eastern areas of the Black sea. In spring-autumn 2008-09 during complex expeditions of the Southern Scientific Centre RAS we have found 114 species of the phytoplankton in the open North-Eastern part of the Black sea. Among them two exotic species: Oxytoxum variabile Schill., Gymnodinium stellatum Hulburt were observed. During 1997-2007 in structure of the phytoplankton of the Novorossiysk Bay we have been found 6 new species (Asterionellopsis glacialis (Castr.) Round., Lioloma pacificum (Capp) Hasle, Alexandrium ostenfeldii (Pauls.) Balech et Tangen., Dinophysis odiosa (Pavillard) Tai & Scogsberg., Phaeocystis pouchetii (Hariot) Lagerheim, Alexandrium ostenfeldii (Pauls.) Balech et Tangen) too. Last toxic species in the open part of the Novorossiysk Bay in 2004 have been fixed its density was 0.2 mln.cell/m³.

The researches of the phytoplankton in the Port of Novorossiysk in 2006-09 as well showed the increasing of the phytoplankton diversity of the Black sea due to ships’ ballast water transport. Thus cells of an oceanic species of Bacillariophyta Bacteriastrum hyalinum Laud where contained in ballast waters of the tanker “Bianco Amoretti”, arrived from the Mediterranean Sea in October 2006. In ballast waters of tanker “Super Lady” that came to the Port of Novorossiysk from Amsterdam Port in October 2009 the unusual for the Black Sea species of Bacillariophyta such as Rhizosolenia setigera Bright, R. cf. styliformis Bright, Lithodesmium cf. undulatum Ehren, Odontella sinensis (Grevielle) Grunow have been found.

The new species of the phytoplankton in case of their successful acclimatization can serve as a forage reserve for native organisms of the Black Sea. However occurrence and mass development of potentially toxic exotic species creates threat for animals such as filtrators that consume plankton algae and people’s poisoning (Senicheva, 2002). In connection with this the monitoring of taxonomic diversity of the phytoplankton and its quantitative development in coastal waters of the Black Sea is still very relevant.
CURRENT CHANGES IN FISH POPULATION OF THE EUROPEAN RUSSIAN NORTH-EAST LARGE RIVERS

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The current changes in fish population of the European Russian North-East water-bodies are due to both the invasion of new fish species and active expansion of fish species which were few till today. For the last decades only, a list of fish species inhabiting water-bodies of Komi Republic increased by 11 new species.

The Pechora River basin was identified for 6 new species. River plaice (Ponomarev et al., 1995) seems to have appeared due to single migration cases from river mouth where it is a common species. Humpback salmon was introduced into the Pechora when its fry was released into the Kola Peninsular rivers in 1956-57 years. Now it is often-met in catches. In the Pechora River basin, besides its main channel, this species was found in tributaries, namely Tsilma, Usa, Kozhva, and Pizhma rivers (spawning including). Sterlet was introduced from the Northern Dvina in 1928-33 and 1949-50. Nowadays this species developed a self-reproducing population being commercially strong in number in the Middle and Low Pechora (Zakharov et al., 1998).

Siberian sturgeon was mentioned to inhabit the Pechora River by N.Ya. Danilevskyi (1862). Next time this fish species was caught only in 2005 (Zakharov et al., 2007). Its underyearling was caught in the Pechora in 2006 that indicates natural reproduction of Siberian sturgeon. Leucaspius delineatus was first mentioned by V.I. Ponomarev for Pechora small tributaries (Pechora city vicinities) in 2004. This species was found in the water reservoir-cooler of the Pechora electric power station and in a series of lakes within Pechora region. An other carp species, bleak, was found in the water reservoir-cooler of the Pechora electric power station; one individual was caught in the Pechora River. By morphological features Leucaspius delineatus is assumed to have inhabited the Pechora basin for a long time, whereas bleak seems to be occasionally introduced from cage farm which was organized on the base of the Pechora electric power station water reservoir-cooler.

The Northern Dvina basin has been connected to the Volga-Kama basin through artificial channels for almost 200 years which serve “invasive” fish migration corridors between the Volga and the Northern Dvina basins. The existing data (Lepekhin, 1814; Lukash, 1923; Ostroumov, 1972; Solovkina, 1975; Sidorov, 1983; Kuderskiy, 1989; Novoselov, 2000; Boznak, 2003 et al.) allow for a conclusion that self-distribution and partly occasional introduction caused the appearance of sterlet, sabrefish, silvereye, asp, zander, and Amur sleeper in the Northern Dvina basin. Rudd was found in the Vychegda River basin and is an aborigine. Also, the Vychegda River basin was identified for broadening the habitat of chub that earlier preferred the Upper Sysola and its tributaries. Most invasive species (and species with a broadening habitat) are euryphages (Amur sleeper, sterlet, partly Siberian sturgeon, rudd) or predators (zander, chub, asp). Almost all of them stay in river-bed for all their lives which lowers their dependence on floodwater level and gives them fewer chances to be caught. The mean individual fecundity of practically all commercial invasive species is 20-30 % more than that of aborigine species.

So, the changing environmental conditions, presence of invasive corridors, acclimatization activities and occasional introduction cases provided for appearance of some freshwater species in northern rivers and broadening the habitat of species earlier limited in area.

Appearance of new commercial fish species in northern river ecosystems is possible, not their naturalization (because of high catches ratio). Possible is successive immigration of small non-commercial fish species with a high adaptive potential. In the nearest future we may await some species of bullhead, well-presented in freshwater water-bodies of the Volga-Kama basin.
INVASION OF ECOSYSTEM ENGINEER - EUROPEAN BEAVER (CASTOR FIBER) IN THE VALLEY OF THE TADENKA RIVER (PRIOKSKO-TERRASNYI NATURE RESERVE)

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The results of the analysis of population dynamics of beaver (Castor fiber) in Prioksko-Terrasnyi Nature Reserve and its settlements in the valley of the Tadenka River within the period of 1948-2009 are presented. It is demonstrated that after the reintroduction of two couples of beavers in the basin of the Tadenka in 1948 the number of settlements in 60 years has stabilized in the range from 9 to 12. It was revealed that the increase in the number of settlements in adverse environmental conditions at the time of beaver’s reintroduction was due primarily to the increased capacity of the habitats as a result of construction activities and the remote use of forage resources in the absence of large predators. A complex analysis of the chorological distribution of settlements, the sizes of occupied sites, the number of dams in the settlements, peculiarities of foraging, stocks of fodder resources and also processing of time series data allowed to assert that the population of beavers of the Tadenka reached climax stage of development. It was concluded that further development of the beaver population would depend largely on functional factors (geomorphological characteristics of the terrain, the rate of feed recovery in abandoned habitats, the scale and speed of development of black alder (Alnus glutinosa) communities in abandoned beaver ponds) influencing the dynamics of a beaver population in the reserve.

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INVERTEBRATE SPECIES NEW FOR THE RYBINSK RESERVOIR BASIN: POSSIBLE REASONS OF THEIR INTRODUCTION AND FINDING

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Among the main reasons of appearance of new for the region invertebrate species we consider their introduction together with the aquarium fauna and spreading following introduced vegetation, aquatic vertebrates and semi-aquatic animals which are invasive species or migrate at the considerable distance. At this the naturalization and mass development of new species can occur under optimal trophic and temperature conditions.

At the beginning of the 21st century among exotic species introduced into the basin together with the aquarium fauna Costatella integra (Haldeman) was found in the ditch filled with the treatment plant waters. Earlier in Russia the mollusk was found in the Volga delta, Ciscaucasis and in the south of the Primorsky Krai. Apparently, its development in highly eutrophic waters occurs at high temperatures and during a long period of vegetation. An increase of the water temperature in the summer of 2007 stimulated the mass development of Craspedacusta sowerbii Lankester, which appeared in the waterbody at the stage of the microhydra polyp and reached its maximal abundance at water heating up to the optimal temperature for bud reproduction (≥ 26 °C). Its expansion can be associated with the introduction into the Volga basin of tropical weeds pistia and water hyacinth, colonizing cooler-reservoirs and spreading farther to the north as the fouling organism of ships.

Since 2000 in the beaver’s ponds of small rivers medicinal leech (Hirudo medicinalis L.) has been recorded which is widely spread in the south of Russia and in adjacent territories of Ukraine, Caucasus and Central Asia. It is probable that at the background of the global warming the beavers promoted migration of this southern species to the north. In 2009 in sites of water fowl nesting in the littoral of the reservoir the leech of the family Piscicolidae was found. The most of its features are typical for the Baikal species Baicalobdella torquata (Grube), and some of them for Caspiobdella tuberculata Epstein. The final identification of the species needs further investigations in order to establish the relationship of this parasitic species either with the Baikal invasive species Gmelinoides fasc and iatus (Stebbing), or to consider the other variants of its introduction.
DISTRIBUTION OF POLYCHAETES *MARENZELLERIA NEGLECTA* (SIKORSKI AND BICK 2004) AND *MANAYUNKIA AESTUARINA* (BOURNE, 1883) IN THE EAST PART OF GULF OF FINLAND (BALTIC SEA).

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The benthic communities of shallow-water regions in east part of Gulf of Finland have been researched since the first half of XX century. The annual hydrobiological monitoring has been begun since the beginning of hydroengineering work in 2000. The changes of abundance of introduced species have been analyzed on example of Luga bay.

The polychaete *Marenzelleria neglecta* has been recorded in the east part of Gulf of Finland since 1996. Abundance M. neglecta on bottom area of Gulf of Finland has been continuously raising. The result of sampling in last year (2009) has been 100% occurrence for this species in all bays in east part of Gulf of Finland. The species has met at all range of salinity (0-7‰) and depth (3-51 meters). But maximum density (2520 in./m²) and biomass (12 g/m²) of polychaete have been recorded in the deepest stations with high salinity. In shallow water and coastal area the polychaete has been recorded rare and not every seasons. There has dominated the *Manayunkia aestuarina*.

This species has been registered in many of shallow-water bay in the east part of Gulf of Finland with low density. The maximum density *M. aestuarina* have attained in Luga bay in shallow-water and coastal area.

The *M. aestuarina* has been recorded in Luga bay, since 2006. The maximum of abundance of *M. aestuarina* has been registered in 2008 (7550 in./m², 1 g/m²). In 2009 the density of this polychaete was declined.

The introductions of two species of polychaete worms have not had significant influence on the biomass of the benthic community in shallow-water bay of the east part of Gulf of Finland. The abundance of coastal zoobenthic community and especially soft “forage” benthos have decreased for last decade. After introduction the two mass species the forage base of fish-benthophage have begun increase.

Analyzing the areas with the high density of *M. neglecta* and *M. aestuarina* in the Luga bay these species have preferred biotopes with the different environmental conditions.

The mass development of two species of introduction polychaetes have not prevented probably by a high turbidity of water and decrease of content of oxygen in water as result by active hydro-engineering in the big part of Luga bay.
The problem of marine bioinvasions is known to be pressing, especially for the Russian Far East seas. The expected positive economic development of Primorsky Krai will cause the increased human pressure on the coastal ecosystems of Peter the Great Bay, which will correspondingly lead to the invasion of alien species with ballast water and hull-fouling of cargo and passenger ships.

In 2005 a working group “WG-21: Non-indigenous Aquatic Species” was created within the framework of the North Pacific Marine Science Organization (PICES) (Radashevsky et al., 2008). Among the tasks of this working group is to develop a Nonindigenous Species Information System (NISIS) database integrating information on the alien species from North Pacific countries: Canada, China, Russia, USA, South Korea, and Japan (http://www.pices.int/members/working_groups/wg21.aspx). The draft database was discussed for the first time at the workshop of the WG-21 within the framework of the 16th annual PICES Meeting in Victoria (Canada) in October 2007. At this meeting a group of scientists from Newport, USA, volunteered to design the shell of the NISIS. The first version of the NISIS shell based on the Microsoft Access software (version 2003 or later) was presented at the WG-21 workshop in Pusan (South Korea) in March 2008. The NISIS database allows standardizing the entering and search of various data on biology, ecology, and distribution of the species inhabiting North Pacific. Each country-member of the PICES will enter its data separately, and the national NISIS will be combined into a common database by the database designers from the USA. An open website with an integrated NISIS database will be created to provide the access to all published and processed information on the alien species of the North Pacific. The first version of the site was presented at the 17th annual PICES meeting in Dalian (China) in October 2008. It contained the list of species introduced into the northwestern part of the Sea of Japan provided with brief information on their finding and origin (Radashevsky, 2008). This list was supplemented with several new species recorded in 2009.

The designers of the electron NISIS database use a somewhat simpler classification of alien species at different stages of acclimatization. This classification is aimed at revealing all kinds of species having indefinite origin, just to avoid criticism from those who are against a status assigned to a species. Following the NISIS scheme, the new list of alien species in the Russian Far East seas includes 63 species.
EIGHT-STRIPED CICHLASOMA – AN ALLOCHTHONOUS CICHLID FISH (PERCIFORMES: CICHLIDAE) FROM STARAYA KUBAN LAKE, KRASNODAR

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An allochthonous cichlid fish Rocio octofasciata (Regan, 1903), new to Russian fish fauna, was identified and described in Staraya Kuban Lake. This reservoir is situated within the city limits of Krasnodar, serving as cooling pond for the Krasnodar cogeneration station. Invasion of eight-striped cichlasoma, very aggressive and eurybiontic species, to the southern Russia was not formerly reliably confirmed and reflected in the scientific literature.

Eight-striped cichlasoma originates from small rivers of Central America’s Atlantic slope. However, it is presently found in a large number of freshwater bodies of the southern United States, Australia, Thai and many other regions all over the world. It is assumed that this cichlid penetrated into new areas owing to purposeful or accidental releases from public and/or home aquariums and aquarium fish farms but not because of natural expansion of its native range.

An analysis of the species’ living conditions in various regions (within the native range, in the water bodies of the southern United States, and in Staraya Kuban Lake) was carried out. Estimates of the main meristic characteristics of the fish, data on its feeding in the lake and values of several most important morphofunctional characteristics of cichlasomas are provided. It was suggested that this species formed a self-sustaining population in the lake, being completely naturalized. The estimation of the effect of eight-striped cichlasoma on the lake’s ecosystem is possible only after an integrated studies of feeding, reproduction, competitive relations with other fish, population dynamics, and other specific features of this species biology. Thus, further studies of this alien fish species in Staraya Kuban Lake were proposed.