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# АРИДНЫЕ ЭКОСИСТЕМЫ ARID ECOSYSTEMS

Журнал освещает фундаментальные исследования и результаты прикладных работ по проблемам аридных экосистем и борьбы с антропогенным опустыниванием в региональном и глобальном масштабах. Издается с 1995 года по решению Бюро Отделения общей биологии Российской академии наук.

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## ARID ECOSYSTEMS

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## ABSTRACTS

### HISTORIC RANGE OF GEOGRAPHICAL DISTRIBUTION OF EURASIAN SAIGA (*SAIGA TATARICA* L.) IN KAZAKHSTAN

© 2009. P.A. Tleuberdina, B.S. Kozhamkulova

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**Abstract.** The complete updated information on findings of fossil antelope-saiga in Kazakhstan is presented. Saiga was considered, from the ancient times, as one of the most available game animals and played important role in the life of Paleolithic man. About this are said the rock figures of saiga outline of Bronze epoch in Kazakhstan in Tamgaly gorge and Semirechie. The most ancient findings of fossil saiga on the territory of Kazakhstan are marked in Preirtyshie middle Pleistocene. However, time of saiga general appearance and distribution in Kazakhstan falls on Mustie epoch. Beginning from 1960, on the territory of Kazakhstan were found 35 localities with fossil saiga remains from late Paleolithic encampment from the Ural R. to Altay mountains. Abundance of saiga remains in Paleolithic encampments is pointed to favourable conditions of inhabitation in Pleistocene landscapes. Process of historical changes of landscape-climatic conditions favoured the creation of ecological niche, favourable for dispersion and acclimatization of saiga paleopopulation at the territory of Kazakhstan in postglacial epoch. Data on fossils remains indicates that borders of fossil saiga distribution, especially at the end of late Pleistocene, were situated northward of modern range borders. Eurasian antelope-saiga inhabited on the territory of Kazakhstan more than 100 thousand of years and may exist there for a long time in absence or significant weakening of anthropogenic pressing or natural cataclysms and strengthening of nature protection laws.

**Keywords:** saiga, Pleistocene, area, paleopopulation, ecologic niche, accompanying fauna.

### STRUCTURAL AND FUNCTIONAL ORGANIZATION OF ECOSYSTEMS OF THE ISLANDS' COASTS IN THE MIDDLE PART OF VOLGOGRAD RESERVOIR<sup>1</sup>

© 2009. I.B. Shapovalova

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**Abstract.** For the first time the reservoir is considered as a complex of ecological influencing factor of the island ornitocomplexes on the south of Saratov region and the main factors of this influence are given. The characteristics of modern island ornitofauna had been elaborated and the changes in landscapes transformation due to the reservoirs creation have been shown. The peculiarities of species composition and population in each of the biotops on the islands in nesting period in different years were revealed. Seasonal and daily trends were taken into account. The share of middle zone islands of Volgograd reservoir in the formation and preservation of Saratov region ornitofauna was estimated. The suggestions for the regime management of Volgograd and Balakovo hydroelectric complexes were made.

**Keywords:** steppe zone, reservoir, ecotone system, ornitocomplexes, ecosystem, transformation, water regime, water level trends.

### SALT AEROSOL INFLUENCE ON RAINFALL IN THE ARAL SEA REGION

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<sup>1</sup> The work was made under the support of the project of the Earth Sciences Department № 14.

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**Abstracts.** Influence of salts carrying out from the drained bottom of Aral sea on processes of rainfall in the Southern Aral sea region is considered. Results of numerical experiments with mathematical models of aerosol salt carry and its influence on microphysical processes in clouds are presented. The obtained results are in good agreement with the observed ones and prove importance of aerosol salts role from the postaquatic land as climate-forming factor.

**Keywords:** Aral sea drying, salt carrying, rainfall (deposit formation), mathematical modeling.

## HIGHER AQUATIC VEGETATION AND ACCUMULATION PROCESSES IN THE DELTA OF RIVER VOLGA

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**Abstract.** Microelements concentrations in water, bottom sediments and macrophytes in the river Volga delta have been evaluated. Some peculiarities of their accumulation in bottom sediments and aquatic plants have been studied in several parts of the delta. It was shown that these plants responded differently to the decrease of heavy metals concentrations in water and bottom sediments during last years. So the content of some elements (Cu and Zn) has decreased in all macrophyte species, while for other elements (Co, Ni, Cd and Pb) the tendency was quite opposite.

**Key words:** heavy metals, macrophytes, sediments, delta of the river Volga.

## INFLUENCE OF RAPID CHANGES CLIMATE ON PHYTOAMELIORATION SOLONTSCHAKS IN THE ARAL SEA REGION

© 2009. Zh.W. Kuzmina\*, S.Y. Treshkin\*\*

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**Abstract.** The results of experimental investigations of the formation of artificial pastures on the former bottom of the Aral Sea under conditions of rapid changes climate by using halophytic species of vegetation are examined. The analysis of trends of daily meteorological data WMO (for 2002 inclusive) has shown, that in Priaral'e authentic significant changes of a climate are observed. Increasing tendencies are: increase of temperatures and reduction of precipitation in warm half-year, in the summer and in the autumn, and also a cold snap in an annual cycle due to cold half-year and a winter season. Now in the South Priaral'e sharp fast climatic fluctuations of a geothermal regime year by year, especially appreciable in the cold season are precisely secreted. Here tendencies are marked: □the general annual warming of climate due to its significant warming in vernal-aestival-autumnal season (from May till October); □periodic (i.e. in a year) sharp fluctuations of temperatures (maximal and monthly average) in the winter from very low ( $t_{av}=-15.1^{\circ}\text{C}$ ,  $t_{min}=-32.2^{\circ}\text{C}$ ) up to high ( $t_{av}=1.0^{\circ}\text{C}$ ,  $t_{min}=-12.3^{\circ}\text{C}$ ); periodic (in 2-3 years) sharp fluctuations in a moisture from maximal (240-314 mm in 2002-2003) up to minimal (90 and 89 mm in 2005 and in 2007) rainfall amounts. Real climatic conditions in field (actual temperature of air and its relative humidity) have appeared much more continental, than it was normally accepted to consider on the basis of the standard given meteorological stations.

Infrequent watering on the salted grounds salutary influences formation of the sizes of plants, increasing their height and reducing number of specimen on the areas, forming larger and viable specimen of plants, both as annual and perennials. Plantings of perennial grasses are more stable in adverse weather conditions of sharply changing climate of the Southern Priaral'e. Watering increases a projective covering, quantity and height of plants. It is established, that the planted vegetation on drying bottom land of Aral sea (with *Haloxylon aphyllum*) promotes lowering of average daily temperatures of air on 0.9-1°C in comparison with the bared plots (Muynak). Black saxaul (*Haloxylon aphyllum*) plantings under natural conditions on solonchaks of the dried Aral Sea bed endure a moisture deficit from a decrease in atmospheric precipitation better than cherkez (*Salsola richteri*) plantings.

For a good survival of seedlings of *Haloxylon aphyllum* and *Salsola richteri* on solonchaks of the drying bottom land of Aral sea the congenial weather is necessary and climatic conditions: first of all it is the increased amount of rainfall (140-220 mm) in comparison with norm, and also not so cold winters (with average temperature in the coldest month – -1-2°C), not so hot summer (with average temperature in the coldest month 26-27°C) and absence of frosts in the vernal season.

**Key words:** air temperature, soils temperature, relative air humidity, ecosystems, soil salinization, solonchaks, halophytic plants.

## **ON VARIABILITY OF DIMENSION CHARACTERS OF GENERATIVE SHOOTS *TRIFOLIUM AMBIGUUM* BIEB. FROM MOUNTAINEOUS INLAND DAGESTAN**

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**Abstract.** The structure of variability of growth (dimension) characters peculiar to generative shoots of Clover resemblant – *Trifolium ambiguum* Bieb. have been studied depending on the altitude of vegetation and changeable conditions of habitat. Forage quality and nutritive value of Clover resemblant have been assessed.

**Key words:** Clover resemblant, dimension characters, generative shoot, stem, leaves, inflorescences, correlation, dispersion and regression analyses.

## **FIRST EDITIONS OF MEDICAL-DEMOGRAPHICAL ATLASES**

**MEDICAL-DEMOGRAPHICAL ATLAS OF KALININGRAD REGION/ EDITOR-IN-SHIEF  
S.M.MALHAZOVA. M., 2007. 87 P.; MEDICAL-DEMOGRAPHICAL ATLAS OF MOSCOW  
REGION / EDITOR-IN-CHIEF S.M.MALHAZOVA, A.N.GUROV. V., 2007. 110 P.**

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**Abstract.** The atlases under concern are the first scientific-reference editions of medical-demographic content. They are very important as sources of information for scientific and practical purposes and first of all for solving the problems of improvement and maintenance of public health, of social-economical development of regions and of environment protection. They are especially useful for administrative departments.

The structure of atlases as collection of map material providing all necessary and available data for solving the presented problem as well as original content of each map is of doubtless scientific interest.

In the Atlas of Kaliningrad region the most interesting are maps of population migration as spreading of natural-nidal diseases, while in the Atlas of Moscow region – the maps of social-meaning pathologies and estimation of the state of population health, maps of main indices of work of medical emergency.

**Key words:** medical geography, public health, atlas.

## 10 YEARS OF KALMYK INSTITUTE OF SOCIAL-ECONOMICAL AND RESEARCHES OF LAW (SU KISELR)

© 2009. D.A. Mandgieva

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This year it is 10 years of organization of Kalmik institute of social-economical and law researches (SU KISELR). The aim of the Institute work was defined as monitoring of social-economical and resource potential and determination of the perspective of sustainable development of Kalmik republic. The principal work directions at the institute are connected with researches of the state of economy, ecology, with social-political, sociological, archaeological researches, with complex studies of natural resources with use of modern methods and technologies. Results of works of the Institute staff are published in the journal “Vestnik of KISELR” which is published since 2001 with periodicity 2 issues per year. In September 2008 aiming at strengthening of its ecological competence the administration of Kalmik Republic decided to reorganized it and rename. Its new name will be the Institute of complex researches of arid territories.

## THE V-th INTERNATIONAL SYMPOSIUM «STEPPE OF NORTHERN EURASIA»

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The Vth International Symposium “Steppes of Northern Eurasia”, organized by the Research Institute of Steppes (Ural Branch of Russian Academy of Science), was held in Orenburg on the 17-21th of May 2009. The main goal is the decision – making of the most important issues in the sphere of the steppe nature management, the research and maintenance of landscape and biological multiplicity of steppes in XXI century. More than 200 participants from 8 countries and 32 regions took part in the symposium.

## NEW BOOKS

**Tishkov A.A. Biosphere functions of natural ecosystems in Russia / Editor: Koronkevich N.I. Moscow: Nauka, 2005. 309 p.**

In monograph the ideas of Russia as “ecological donor” of the planet and concept of “ecosystem services” are presented, based on the biosphere functions of natural ecosystems – bioproduction, global carbon balance maintenance, climatic and water regulation, antierosional, biodiversity, genetic and biological resources preservation, etc. The quantitative characteristics of zonal and intrazonal ecosystems of Russia functioning are given. These characteristics serve for evaluation of its “ecosystem services” as global. The possibility of its economic estimation taking into consideration the effectiveness of its nature conservation activity and for organization of nature conservation funding on compensation base is discussed.

For geographers, ecologists and specialists in the sphere of nature-use economics, theoretical and practical workers in the sphere of biodiversity preservation as well as for the curious reader who is concerned in the new ways of nature conservation.

**Soil and vegetation resources of southern regions of Russia, their evaluation and management with the use of information technologies. Materials of all-Russian scientific conference / Managing editor Zalibekov Z.G. Makhachkala: Editing house “Nauka Plus”, 2007. 128 p.**

The conference took place in Makhachkala at the Institute of biological resources of Far-East scientific center of RAS and Biological faculty of Dagestan state university. The theme of the conference was the

problems of “Soil and vegetation resources of southern regions of Russia, their evaluation and management with the use of information technologies”. In the work of the conference the wide range of specialists, scientist, teachers of high school, post-graduate students, students took part. More than 50 scientific papers were read and discussed. The information on the problem of evaluation and management of soil and vegetation resources under conditions of desertification and arid degradation was accumulated at the conference.

**Landscape Zoogeography and Zoology. A.P. Kuzyakin commemorative session. Proceedings / Sc. Eds.: Mazin L.N., Ravkin E.S., Kuzyakin V.A. Moscow: Moscow Society of Naturalists, 2008. 291 p.**

The book contains materials of the conference, organized by the Zoology section of the Moscow society of nature probators together with Moscow branches of the all-Russian Teriological, and Ornithological Societies, the Russian Entomological Society and the Biogeographical commission of the Moscow center of the Russian Geographical Society (13 February 1995, Moscow). Problems of landscape zoogeography and zoology are discussed. The book can be useful for entomologists, ornithologists, teriologists, ecologists, game experts and zoogeographers.

**Kovda V.A. Problems of desertification and salinization of soils in the arid regions of the world / Ex. Editors: Pankova E.I., Aidarov I.P. M.: Nauka, 2008. 415 p.**

The book of outstanding soil-scientist of the XX century V.A. Kovda reflects the state of the problem of desertification and salinization of the soils in the world by the beginning of 1980-ies. In the monograph the information on the natural and anthropogenic processes of desertification and salinization of the soils and laws of these processes in the different regions of the world are summarized.

The characteristics of geochemical landscapes of deserts and steppes as objects of salt-accumulation are given. The cycles of salt-accumulation and geochemical provinces of modern salt accumulation in Russia and neighboring countries are described. The processes of soil and ground waters salinization as well as features of secondary salinization on the lands under irrigation are considered. The monograph contains large material on the history of the theory and practice of combat against desertification and soil salinization in the world in XX the century.

For geographers, specialists in land-reclamation, soil scientists and geochemists as well as for the historians of the science. The book may be used as the textbook for students and post-graduate students of proper faculties.

**Novikova N.M., Kuz'mina Zh.V. Monitoring of the vegetation in conditions of the Aral Sea ecological crisis / Translation from Russian to English T.V. Dikareva, Edition of the English version Shafroth P.B. Moscow: Russian academy of agricultural sciences (RAAS), 2008. 218 p., including 23 tales, 23 figures, 2 maps (In English).**

This book is the result of more than 30 years studies within Priaralie for dynamics of vegetation in conditions of the developing ecological crisis and aridization of the environment within the Amu Darya and Syr Darya river deltas. Plant communities composition and structure are used as an indicators of the ecosystem's dynamics and evaluation.

**Kartasheva L.M., Komova A.V., Kuznetsov B.I., Mukovnina Z.P., Nikolaev E.A., Safonova O.N., Shestopalova V.V., Shipilova V.F., Sheglov D.I. Catalogue of plants of the Botanical garden named after professor B.M. Kozo-Polianskiy at Voroneg State University/ Editor-in-chief Sheglov D.I. Voroneg: Editing house of Voroneg State University (IPC VSU), 2008. 182 p.**

The competent list of plants is given which reflects the collection and exposition of Botanical garden of Voroneg State University. For each taxon the Latin and Russian names are given, year of including into collection, belonging to the order, quantitative characteristics, life form, ultimate phenological stage, relevance to the environment factors, agricultural value.

The book is dedicated to botanists – introduction workers, flower-growers, phyto-designers, teachers and students of relevant colleges.



**MARTIN GAIKOVICH KHUBLARIAN**

**IS GONE**

**March 05, 1935 – July 27, 2009**



On July 27, 2009 suddenly died the outstanding scientist, talented organizer of science, full member of Russian Academy of Sciences, Academy advisor, the chief editor of the journal “Water resources” Martin Gaikovich Khublarian.

Fruitful scientific activity of M.G. Khublarian was at its full prosperity during his work at Academy of Sciences. In 1984 he was elected Corresponding Member of Russian Academy of Sciences, in 1992 – professor, in 1994 – full member of Russian Academy of Sciences.

Beginning from 1988 till 2000 he was the head of the Water Problems Institute, Russian Academy of Sciences. M.G. Khublarian is an outstanding scientist in the sphere of investigations of terrestrial waters. He published more than 200 works, including 7 monographs. He took part regularly as an expert in the committees on legal documentation of big ecological projects and programs.

Fruitful scientific and scientific-organizational work of M.G. Khublarian was awarded with three medals and the Order of Honour. The Science suffered an irreplaceable loss. The blessed memory of Martin Gaikovich will be always in our hearts.