

ABSTRACTS

SECTION 1. PHYSICAL AND CHEMICAL MATERIALS SCIENCES

Svetlichnyy D.A., Mikhailov I.E. **Synthesis and spectral-luminescence properties of new luminophers based on 8-hydroxyquinoline derivatives for organic light-emitting diodes** // Matishov, G.G. (Ed.). Studies of the Southern Scientific Centre of the Russian Academy of Sciences (Series). Issue IX (2021): Research by Young Scientists of the SSC RAS. Managing Editor of the Issue: Dr (Geography) S.V. Berdnikov. Rostov-on-Don: SSC RAS Publishers. P. 12–20. (in Russian).

Abstract. Condensation of 2-methylquinoline with 4-cyloxybenzaldehyde in acetic acid anhydride has yielded 2-(4-(octyloxy)-styryl)8-hydroxyquinoline along with its methyl, acetyl, benzyl and dansyl derivatives. Tosylation of 2-styryl-8-hydroxyquinoline has led to the corresponding 4-luenesulfonyloxy derivative. All the obtained compounds have revealed blue-green luminescence ($\lambda_{\max} = 510\text{--}590\text{nm}$); however, only alkyl derivatives of 2-styryl-8-hydroxyquinoline possessed the high quantum yield ($\varphi = 0.17\text{--}0.20$).

Keywords: 2-styryl-8-hydroxyquinoline, absorption spectrum, luminescence spectrum, quantum yield, organic luminophore.

Nazarenko A.V., Rudskaya A.G., Pavlenko A.V., Rudsky D.I., Abdulvakhidov K.G. **Microstructure and properties of YMnO_3 multi-ferroic with small copper additives under different synthesis conditions** // Matishov, G.G. (Ed.). Studies of the Southern Scientific Centre of the Russian Academy of Sciences (Series). Issue IX (2021): Research by Young Scientists of the SSC RAS. Managing Editor of the Issue: Dr (Geography) S.V. Berdnikov. Rostov-on-Don: SSC RAS Publishers. P. 21–28. (in Russian).

Abstract. Solid solutions of the $\text{YCu}_x\text{Mn}_{1-x}\text{O}_3$ system were synthesized at $x = 0.05; 0.10; 0.15$ using conventional ceramic technology and applying preliminary mechanical activation. Studies of the structure and microstructure of the obtained samples have been carried out. It was ascertained that mechanical activation practically completely excludes the formation of a hexagonal phase. Analysis of the microstructure of all compositions indicated that the synthesis in both cases proceeded with the formation of liquid phases. Their traces are noticeable in the intergranular interlayers; in addition, the grains have a rounded habit. It is indicated that in mechanically activated compositions the overgrowth of grains with a nanocrystalline phase is observed. The study of the temperature dependences of the resistivity showed an anomaly, which, apparently, characterizes the onset of structural rearrangement leading to a further phase transition.

Keywords: multiferroics, yttrium manganite, solid solution, resistivity, microstructure.

Anokhin A.S., Pavlenko A.V. **Lattice dynamics of the iron-based double perovskite** // Matishov, G.G. (Ed.). Studies of the Southern Scientific Centre of the Russian Academy of Sciences (Series). Issue IX (2021): Research by Young Scientists of the SSC RAS. Managing Editor of the Issue: Dr (Geography) S.V. Berdnikov. Rostov-on-Don: SSC RAS Publishers. P. 29–36. (in Russian).

Abstract. The lattice dynamics of double strontium ferrotungstate perovskite was studied by Raman spectroscopy in the temperature range of 300–700 K. The tetragonal symmetry of the ferroelectric phase at room temperature was confirmed. The temperature range of the diffuse phase transition from the tetragonal to the cubic phase and the specific features of the change in the phonon spectrum of strontium ferrotungstate are determined.

Keywords: ferrotungstate, multiferroics, ferroelectric relaxor, Raman spectroscopy.

Stryukov D.V., Pavlenko A.V. Intermittent deposition of $\text{Sr}_{0.5}\text{Ba}_{0.5}\text{Nb}_2\text{O}_6$ thin films with different layer thickness // Matishov, G.G. (Ed.). Studies of the Southern Scientific Centre of the Russian Academy of Sciences (Series). Issue IX (2021): Research by Young Scientists of the SSC RAS. Managing Editor of the Issue: Dr (Geography) S.V. Berdnikov. Rostov-on-Don: SSC RAS Publishers. P. 37–42. (in Russian).

Abstract. The intermittent deposition technology was used to fabricate $\text{Sr}_{0.5}\text{Ba}_{0.5}\text{Nb}_2\text{O}_6/\text{MgO}$ epitaxial thin films. The films have been fabricated with unaltered total thickness, while the thickness of each layer has been varied. A decrease of the layer thickness below the critical one leads to an increase in the lattice constant. It has been established that to preserve this effect, the thickness of each deposited layer should not exceed the critical one. When the critical thickness is exceeded, the unit cell parameters relax.

Keywords: ferroelectrics, intermittent deposition, unit cell deformation.

SECTION 2. BIOLOGY AND BIOTECHNOLOGIES

Krasilnikova A.A. Cryopreservation of fish reproductive cells at ultra-high cooling rates // Matishov, G.G. (Ed.). Studies of the Southern Scientific Centre of the Russian Academy of Sciences (Series). Issue IX (2021): Research by Young Scientists of the SSC RAS. Managing Editor of the Issue: Dr (Geography) S.V. Berdnikov. Rostov-on-Don: SSC RAS Publishers. P. 44–51. (in Russian).

Abstract. The object of research is the sperm of sturgeon species (Russian sturgeon *Acipenser gueldenstaedtii* Brandt, 1833, Siberian sturgeon of the Lena population *Acipenser baerii* Brandt, 1869) obtained during the spawning campaign at a sturgeon hatchery. The aim of this work is to study the possibility of cryopreservation of fish reproductive cells at ultra-high cooling rates. The results of the implemented experiments indicated the possibility and prospects of using alternative methods for preparing fish spermatozoa for cryopreservation. The use of ultra-high cooling rates will help reduce the concentration of cryoprotectors in cryoprotective media, which will affect the reduction of toxicity of cryoprotective substances onto cells and increase survival after freezing-thawing.

Keywords: fish reproductive cells, cryopreservation.

*Tazhbaeva D.S. Adaptation and cultivation of so-iuy mullet (*Liza haematocheilus* (Temminck & Schlegel, 1845)) in a recirculating aquaculture system // Matishov, G.G. (Ed.). Studies of the Southern Scientific Centre of the Russian Academy of Sciences (Series). Issue IX (2021): Research by Young Scientists of the SSC RAS. Managing Editor of the Issue: Dr (Geography) S.V. Berdnikov. Rostov-on-Don: SSC RAS Publishers. P. 52–59. (in Russian).*

Abstract. Fish cultivation in recirculation aquaculture systems (RAS) is the most promising and widely used abroad and in our country. Experimental activities on adaptation of so-iuy mullet (or haarder) to the conditions of an artificial ecosystem of RAS were conducted at the aquarium complex of the Southern Scientific Centre of RAS. The full period of adaptation occurs after 45 days with a step-by-step transfer of fish to feeding with granulated high-protein feeds. An experiment was conducted on the cultivation of so-iuy mullet in the RAS using combined feeds with different content of in nutrients in water with different salinity. The results indicated that when growing so-iuy mullet in water with the salinity of 4–5 ‰ and feeding with granulated high-protein feeds (52 %), so-iuy mullet increased body weight by 10.8 g more than in water with the salinity of 0.85–1.6 ‰.

Keywords: so-iuy mullet (*Liza haematocheilus*), adaptation, recirculation aquatic system, combined feed, salinity.

*Glushchenko G.Yu., Syomin V.L. Information on the modern development of the species *Ebria tripartita* (Schumann) Lemmermann (Cercozoa: Ebridae)*

by the results of the monitoring studies of phytoplankton in the Taganrog Bay in 2017–2019 // Matishov, G.G. (Ed.). Studies of the Southern Scientific Centre of the Russian Academy of Sciences (Series). Issue IX (2021): Research by Young Scientists of the SSC RAS. Managing Editor of the Issue: Dr (Geography) S.V. Berdnikov. Rostov-on-Don: SSC RAS Publishers. P. 60–69. (in Russian).

Abstract. The paper provides information about and data on the environmental conditions of the phagotrophic *Ebria tripartita* in the Taganrog Bay of the Sea of Azov, which were obtained during monitoring studies from January 2017 to March 2019 and which suggest a wider range of environmental factors suitable for this species. The presence of species *E. tripartita* in the composition of winter plankton of the Taganrog Bay is registered for the first time. The paper presents the results of an analysis of the species occurrence depending on the development of small-cell species of diatoms and dinophytes. A complex of species (*Heterocapsa rotundata*, *Unruhidium penardii*, *Kolkwitzella acuta*, *Chaetoceros rigidus*, *Chaetoceros socialis*), in the presence of which *E. tripartita* develops, is indicated and described.

Keywords: phagotrophic, *Ebria tripartita*, phytoplankton, dinophytes and diatoms, Taganrog Bay of the Sea of Azov.

Shmatko V.Yu. Diversity and abundance of soil nematodes in dry steppe chestnut-solonetz complexes of the valley of Western Manych // Matishov, G.G. (Ed.). Studies of the Southern Scientific Centre of the Russian Academy of Sciences (Series). Issue IX (2021): Research by Young Scientists of the SSC RAS. Managing Editor of the Issue: Dr (Geography) S.V. Berdnikov. Rostov-on-Don: SSC RAS Publishers. P. 70–86. (in Russian).

Abstract. 238 species of nematodes of 118 genera within 51 families and 10 orders are registered in dry steppe chestnut-solonetz soil complexes of the valley of Western Manych. It has been determined that the composition of soil complexes, which may include soil varieties of non-saline and saline soils, impacts the general abundance in samples and the abundance ratio of trophic groups of soil nematodes, and the specific features of fauna structure are determined and conditioned by a high index of relative abundance in non-saline soils and by a large amount of registered species in saline soil complexes. In the studied key areas, the communities of soil nematodes are formed with the dominance of representatives of the orders of Tylenchida, Dorylaimida, and Rhabditida, which are largely composed of omnivores, phytotrophs, and bacteriotrophs.

Keywords: valley of Western Manych, soil nematodes, chestnut-solonetz complexes, biodiversity, ecological-trophic structure of communities.

Terskov E.N. New and interesting finds of praying mantises (Mantodea) and orthopterans (Orthoptera) in the Rostov Region and Krasnodar Krai // Matishov, G.G. (Ed.). Studies of the Southern Scientific Centre of the Russian Academy of Sciences (Series). Issue IX (2021): Research by Young Scientists of the SSC RAS. Managing Editor of the Issue: Dr (Geography) S.V. Berdnikov. Rostov-on-Don: SSC RAS Publishers. P. 87–95. (in Russian).

Abstract. The article presents data of field studies of recent years, which indicate new finds of praying mantises and orthopterans on the territory of the Krasnodar Krai and Rostov Region. For the first time, *Heteracris pterosticha* (Orthoptera) and *Hierodula transcaucasica* (Mantodea) are registered in the Rostov Region, and *Anacridium aegyptium* (Orthoptera) is registered in the Krasnodar Krai. Interesting finds of such species as *Empusa pennicornis*, *Ameles heldreichi*, *Bolivaria brachyptera*, *Iris polystictica* (Mantodea), *Saga pedo*, *Arcyptera fusca* (Orthoptera) are presented. The *Empusa pennicornis* and *Arcyptera fusca* species are recommended for the inclusion in the Red Book of the Rostov Region.

Keywords: Mantodea, Orthoptera, new finds, rare species, Red Book.

Ermolaev A.I., Rybtsova V.V. To the reproductive biology of closely related birds of the genus *Falco* in a steppe landscape // Matishov, G.G. (Ed.). Studies

of the Southern Scientific Centre of the Russian Academy of Sciences (Series). Issue IX (2021): Research by Young Scientists of the SSC RAS. Managing Editor of the Issue: Dr (Geography) S.V. Berdnikov. Rostov-on-Don: SSC RAS Publishers. P. 96–106. (in Russian).

Abstract. The reproductive biology of common kestrel (*Falco tinnunculus* L.) and red-footed falcon (*Falco vespertinus* L.), nesting in artificial forest stands of the steppe zone (Rostov Region, Russia), was studied. The data on their nesting relationships and buildings in the rookery used for breeding are given, as they do not build their own nests. The red-footed falcon occupies nesting sites later than the common kestrel, selects shallower rook nests with deeper tray depths, located mainly on lateral branches. The common kestrel uses larger rooks' nests with a lower tray height, which are mostly near-stemmed.

Keywords: common kestrel (*Falco tinnunculus* L.), red-footed falcon (*Falco vespertinus* L.), rook (*Corvus frugilegus* L.), reproductive period, nest relationships.

SECTION 3. EARTH SCIENCES

Sushko K.S. Development of the processes of anthropogenic degradation of the island landscapes of the Don River delta based on research materials of 2017–2020 // Matishov, G.G. (Ed.). Studies of the Southern Scientific Centre of the Russian Academy of Sciences (Series). Issue IX (2021): Research by Young Scientists of the SSC RAS. Managing Editor of the Issue: Dr (Geography) S.V. Berdnikov. Rostov-on-Don: SSC RAS Publishers. P. 108–116. (in Russian).

Abstract. As a result of expedition research in the delta of the Don River implemented in the period of 2017–2020, morphological and genetic descriptions of soil profiles were carried out, as well as physical and chemical characteristics of soils were studied. The conditions characterizing the current state and degree of anthropogenic degradation of alluvial soils of the Don River delta were also determined. It is revealed that the soil cover has undergone negative changes due to both natural and man-made factors. These changes are due to the increased anthropogenic pressure on the ecosystem of the Lower Don, the development of hydrotechnical construction, the washout and erosion of beaches and soils as a result of “anthropogenic tsunamis” caused by large-tonnage vessels, increased recreational load, and agricultural activities.

Keywords: alluvial soils, islands, Don Delta, flow regulation, anthropogenic impact, soil degradation.

SECTION 4. POLITICAL SCIENCE, SOCIOLOGY, AND LAW

Goryushina E.M. Armed actions in Chechnya and the conflicts of memory (1994–1996, 1999–2009) // Matishov, G.G. (Ed.). Studies of the Southern Scientific Centre of the Russian Academy of Sciences (Series). Issue IX (2021): Research by Young Scientists of the SSC RAS. Managing Editor of the Issue: Dr (Geography) S.V. Berdnikov. Rostov-on-Don: SSC RAS Publishers. P. 118–131. (in Russian).

Abstract. The article is based on the analysis and synthesis of 49 audio recordings (at the time of publication over the research period) of in-depth interviews with eyewitness respondents and / or participants in hostilities and CTOs on the territory of the Chechen Republic (1994–1996; 1999–2009). The thesis of the dominant role of collective memory is rejected, which is considered as a space where ideas about the past arise and spread as a result of interactions between group members, including institutionally mediated interactions such as public education or commemoration. It has been determined that over some time, the memory of the hostilities in Chechnya continues to play a disintegrating role in the society.

Keywords: conflict, historical memory, memory, Chechnya, interview.

Chelpanova D.D. Monitoring of Protest Activities through Global (Regional) Databases: International and Russian Practices // Matishov, G.G. (Ed.). Studies of the Southern Scientific Centre of the Russian Academy of Sciences (Series). Issue IX (2021): Research by Young Scientists of the SSC RAS. Managing Editor of the Issue: Dr (Geography) S.V. Berdnikov. Rostov-on-Don: SSC RAS Publishers. P. 132–141. (in Russian).

Abstract. The paper considers scientific, theoretical, and applied significance of monitoring of the protest activity of the population as a tool for predicting the risks of socio-political tension in society, which can affect the stability and security of the state. It presents the analysis of the newest platforms for tracking protest activity in Europe and the United States and the accumulation of information through the use of various methods, including applied methods of sociological research, content and event analysis, statistical methods, as well as automated systems that allow tracing information about protest activity on virtual media platforms. The relevant international and Russian practices and experience are also discussed.

Keywords: protest activity, socio-political tension, monitoring, databases, methods.

Chuklina E.Yu. Assessment of the preventive effect of anti-terrorist provisions under Articles 205.1, 205.2, 205.3, and 205.6 of the Criminal Code of the Russian Federation // Matishov, G.G. (Ed.). Studies of the Southern Scientific Centre of the Russian Academy of Sciences (Series). Issue IX (2021): Research by Young Scientists of the SSC RAS. Managing Editor of the Issue: Dr (Geography) S.V. Berdnikov. Rostov-on-Don: SSC RAS Publishers. P. 142–150. (in Russian).

The author examines the mechanism of preventive effect of the norms with double prevention under Articles 205.1, 205.2, 205.3, and 205.6 of the Criminal Code of the Russian Federation, and also evaluates the implementation of their preventive function. Through the analysis of quantitative (statistics) and qualitative (sentences) data, formal legal analysis of the norms, the shortcomings of the studied norms, complicating the qualification of crimes and, accordingly, reducing their preventive potential, were revealed. Based on the analysis results, proposals were developed to eliminate the identified deficiencies.

Keywords: double prevention, countering terrorism, mechanism of preventive effect.

SECTION 5. ECONOMICS AND ECONOMICAL PROCESSES

Patrakeeva O.Yu. National development projects of transport infrastructure: regional dimension // Matishov, G.G. (Ed.). Studies of the Southern Scientific Centre of the Russian Academy of Sciences (Series). Issue IX (2021): Research by Young Scientists of the SSC RAS. Managing Editor of the Issue: Dr (Geography) S.V. Berdnikov. Rostov-on-Don: SSC RAS Publishers. P. 152–160. (in Russian).

Abstract. The discrepancy between economic rates, needs of enterprises and population for transportation, quality of the road network is a significant infrastructural limitation of growth. The paper is devoted to large-scale investment projects aimed at removing infrastructure restrictions, such as the national project “Safe and High-quality Roads” and “Comprehensive Plan for the Modernization and Expansion of Trunk Infrastructure”. The paper presents the results of statistical analysis aimed at identifying the presence of significant economic effect from capital investments in the road infrastructure of the Krasnodar Territory. It is revealed that investments in transport and communications stimulate economic growth and also reduce the accident rate on highways in the long run. In addition, the increase in the density of paved public roads stimulates passenger turnover in the short run and is also a significant factor in reducing the accident rate. The downward trend of paved roads in the total length of roads indicates the necessity to invest in improving the quality of existing roads. The author emphasizes that it is necessary to improve the monitoring system of infrastructure framework of the region, evaluate the effectiveness of administrative decisions.

Keywords: national projects, transport infrastructure, investment, indicators, statistical analysis, socio-economic development.

Uznarodov D.I. Socio-economic aspects of the political development of the Republic of Crimea after 2014 // Matishov, G.G. (Ed.). Studies of the Southern Scientific Centre of the Russian Academy of Sciences (Series). Issue IX (2021): Research by Young Scientists of the SSC RAS. Managing Editor of the Issue: Dr (Geography) S.V. Berdnikov. Rostov-on-Don: SSC RAS Publishers. P. 161–170. (in Russian).

Abstract. The article considers socio-economic processes in the Republic of Crimea after 2014 and their impact on the political development of this region. By analyzing a number of indicators, characterizing the level of socio-economic development, the most and less developed in this aspect municipalities of the Republic of Crimea were identified. Results of elections to the State Council of the Republic of Crimea of the first and second convocations in the most and less economically prosperous municipalities of the region were also studied, and a subsequent correlation was established between the changes in the socio-economic situation in the region and political preferences of the population after 2014. Conclusion is made that there is no direct correlation between changes in the socio-economic situation in the region and political preferences of its population, and we may rather talk about increasing protest moods among the population over the past few years in the absence of sharp improvements in the socio-economic situation compared to the period before 2014.

Keywords: Republic of Crimea, economy, political development, political process, political parties.

SECTION 6. HISTORY AND ARCHAEOLOGY

Medvedev M.V. Memorialization and museumification of the events of the Great Patriotic War in the western areas of the Rostov Region as a factor of historical memory preservation // Matishov, G.G. (Ed.). Studies of the Southern Scientific Centre of the Russian Academy of Sciences (Series). Issue IX (2021): Research by Young Scientists of the SSC RAS. Managing Editor of the Issue: Dr (Geography) S.V. Berdnikov. Rostov-on-Don: SSC RAS Publishers. P. 172–182. (in Russian).

Abstract. The history of the Great Patriotic War entered the space of memory of the Soviet and Russian societies largely due to the perpetuation of its events through memorialization and museumification. The feats displayed by the Soviet soldiers and the trauma inflicted on the Soviet people by the Nazi invaders found expression in the appropriate memorial forms. In the Rostov Region, these processes had significant differences due, firstly, to the specific circumstances of the hostilities – the seizure of the region by the enemy and the subsequent liberation of the region in 1941–1943, and secondly, the specific features of the formation of the memorial practices. As a result, memorial processes in the western areas of the Rostov Region, which suffered the most in the region during the period of hostilities, have their own characteristics. The memory of the fierce battles in these places remained for many decades after the war.

Keywords: Great Patriotic War, Rostov Region, western areas, memorialization, museumification, historical memory.

Rusakov M.Yu. Chronology and typology of the early Scythian quiver sets of the Don-Kagal'nik watershed // Matishov, G.G. (Ed.). Studies of the Southern Scientific Centre of the Russian Academy of Sciences (Series). Issue IX (2021): Research by Young Scientists of the SSC RAS. Managing Editor of the Issue: Dr (Geography) S.V. Berdnikov. Rostov-on-Don: SSC RAS Publishers. P. 183–193. (in Russian).

Abstract. The paper deals with the analysis of quiver sets found in the Early Scythian burials situated between the Don and Kagal'nik rivers. Out of 40 burials of the indicated period, 10 complexes contained 178 arrowheads. Quiver sets are mostly average (about 10–20 pieces), except for two burials with much more numerous sets. All the considered arrowheads are dated to the VII–VI centuries BC (according to A.I. Melyukova). It must be mentioned that we know no Early Scythian burials that can be dated back to the 550–500 BC.

Keywords: Lower Don Region, Don and Kagal'nik rivers, watershed, Early Scythian period, quiver set, arrowheads.