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| УДК 66.047.3.086.2:553.411.08  **O.A. Belavina, D.V. Shunkin, V.A. Shvetsov**  **RATIONALE FOR CHOOSING CELL MATERIAL TO DRY GOLD ORE SAMPLES USING MICROWAVE** **RADIATION**  The article examines the influence of cell material on the characteristics of drying process of samples using microwave radiation under different drying conditions. The article demonstrates that it is impossible to use cheap domestic plastic heat-resistant containers for drying mineral material samples by the method of complete dehumidification. In that case final high temperature results in melting plastic containers. At the same time it is possible to use glass or ceramic cells. The authors have developed the technology allowing to use both ceramic and plastic cells. It allows to reduce costs for preparing mineral material samples for analysis.  **Key words:** cell, drying samples in the microwave oven, samples of mineral material.  *DOI: 10.17217/2079-0333-2016-37-6-9*  **Information about authors**  **Belavina Olga Aleksandrovna** – Kamchatka State Technical University; 683003, Russia, Petropavlovsk-Kamchatskу; Specialist in Technical and Scientific Information of Science and Innovation Department; [oni@kamchatgtu.ru](mailto:oni@kamchatgtu.ru)  **Shunkin Dmitry Vladimirovich –** Kamchatka State Technical University; 683003, Russia, Petropavlovsk-Kamchatskу; Junior Researcher of Science and Innovation Department  **Shvetsov Vladimir Alekseevich** – Kamchatka State Technical University; 683003, Russia, Petropavlovsk-Kamchatskу; Doctor of Chemical Sciences; Associate Professor, Professor of Electrical and Radio Equipment of Ships Chair |
| УДК 620.19:629.5.023  **O.A. Belov, A.B. Doroganov**  **METHODOLOGICAL PROBLEMS IN THE**  **CONTROL OF ELECTROCHEMICAL PROTECTION OF STEEL HULLS**  Corrosion of steel hulls of vessels and ships is the main cause of its deterioration, decrease of durability and safety. Prevention of premature hull wear and also electric filed protection are important operation tasks. There are some methods to control and measure electric field and its protection potential. Each of these methods is based on the using of the definite measuring apparatus and the analysis technology of measuring results. The article deals with the main methods to control and measure ship electric field, protection hull potential and state of engineered and technological defender items against corrosion.  **Key words:** electric field, corrosion, measuring apparatus, electric disconnection, protection hull potential, reference electrode.  *DOI: 10.17217/2079-0333-2016-37-10-13*  **Information about authors**  **Belov Oleg Aleksandrovich** – Kamchatka State Technical University; 683003, Russia, Petropavlovsk-Kamchatskу; Candidate of Technical Sciences; Head of Electrical and Radio Equipment of Ships Chair;  beloff.oa@gmail.com  **Doroganov Aleksey Borisovich –** Kamchatka State Technical University, 683003, Russia, Petropavlovsk-Kamchatskу; Postgraduate; 684007, Russia, Petropavlovsk-Kamchatsky; 697 Supply Vessel Group, Special Work Engineer; boa-1@mail.ru |
| УДК 550.388:621.396  **V.P. Sivokon, I.A. Kalugin, V.S. Kobylkin, A.V. Popov**  **РOLARIZATION FACTOR OF DECAMETER DISPERSAL ON FIELD-ALIGNED IONOSPHERE IRREGULARITIES**  Efficiency of using radio engineering systems in high latitudes in many respects depends on an ionosphere condition. In a range of short waves, ionosphere irregularities of electronic concentration have an essential role. There is a specific class of irregularities. They are field-aligned irregularities which can significantly influence on working capacity of radio engineering systems within a decameter range under certain conditions. The work is devoted to the research of these conditions.  **Key words:** ionosphere, field-aligned irregularities, radio engineering systems.  *DOI: 10.17217/2079-0333-2016-37-14-18*  **Information about authors**  **Sivokon Vladimir Pavlovich** – Institute of Cosmophysical Researches and Radio Wave Propagation, 684034, Russia, Kamchatkа region, Paratunkа; Kamchatka State Technical University; Petropavlovsk-Kamchatskу, Russia, 683003; Doctor of Technical Sciences; Associate Professor; Professor of Electrical and Radio Equipment of Ships Chair; vsivokon@mail.ru  **Kalugin Ivan Artemovich** – Kamchatka State Technical University; 683003, Russia, Petropavlovsk-Kamchatskу; Student; kaluginva@bk.ru  **Kobylkin Victor Sergeevich** – Kamchatka State Technical University; 683003, Russia, Petropavlovsk-Kamchatskу; Student  **Popov Aleksey Vladimirovich –** Kamchatka State Technical University; 683003, Russia, Petropavlovsk-Kamchatskу; Student |
| УДК 620.19:629.5.023  **V.A. Shvetsov, О.А. Belov, P.A. Belozyorov, O.A. Belavina, V.V. Kirnosenko**  **RATIONALE FOR OPERATOR TRAINING FOR MEASURING STEEL HULL POTENTIAL  OF VESSELS AND SHIPS**  It is proved that if there is a specially trained operator on the board, crew can diagnose unacceptable deviations in operations of systems of electrochemical hull protection.  **Key words**: corrosion of steel hulls of ships and vessels, electrochemical protection of the hull against corrosion, measuring the protection potential of the hull, reference electrode, method of measuring the potential of steel hulls of ships and vessels.  *DOI: 10.17217/2079-0333-2016-37-19-24*  **Information about authors**  **Shvetsov Vladimir Alekseevich** – Kamchatka State Technical University; 683003, Russia, Petropavlovsk-Kamchatskу; Doctor of Chemistry; Associate Professor, Professor of Electrical and Radio Equipment of Ships Chair; oni@kamchatgtu.ru  **Belov Oleg Aleksandrovich** – Kamchatka State Technical University; 683003, Russia, Petropavlovsk-Kamchatskу; Candidate of Technical Sciences; Head of Electrical and Radio Equipment of Ships Chair; beloff.oa@gmail.com  **Belozerov Pavel Aleksandrovich** – Kamchatka State Technical University; 683003, Russia, Petropavlovsk-Kamchatskу; Postgraduate  **Belavina Olga Aleksandrovna** – Kamchatka State Technical University; 683003, Russia, Petropavlovsk-Kamchatskу; Specialist in Technical and Scientific Information of Science and Innovation Department; oni@kamchatgtu.ru  **Kirnosenko Vladimir Vladimirovich** – Kamchatka State Technical University; 683003, Russia, Petropavlovsk-Kamchatskу; Postgraduate |
| УДК 664.956:639.228.2M.V. Blagonravova, L.D. GritsaenkoDEVELOPING THE FORMULATION OF SUN-DRIED FISH  WITH VEGETABLE ADDITIVES Research results on developing the formulation of dried flounder with vegetable additives are given in the article. It is proved that dried fillet of flounder with addition of laminarian seaweed, and also dill with red and black pepper, has high organoleptic indicators.  **Key words:** sun-dried fish, flounder, vegetable additives, organoleptic indicators, profilogramma, sociological poll.  *DOI: 10.17217/2079-0333-2016-37-25-30*  **Information about authors**  **Blagonravova Maya Vladimirovna –** Kamchatka State Technical University; 683003, Russia, Petropavlovsk-Kamchatskу; Candidate of Technical Sciences; Associate Professor of Food Production Technologies Chair; mblagonravova@mail.ru  **Gritsaenko Larisa Dmitrievna –** Kamchatka State Technical University; Petropavlovsk-Kamchatskу, Russia, 683003; Undergraduate |
| УДК 574.64(268.45.04)  **E.А. Gorbacheva**  **QUALITY ASSESSMENT OF BOTTOM SEDIMENTS IN THE MOTOVSKY BAY**  **OF THE BARENTS SEA BY METHOD OF BIOTESTING**  There was a study of the toxicity of water extraction from bottom sediments in the Barents Sea of the Motovsky Bay using cultures of microalgae *Phaeodactylum tricornutum* Bohin and shrimp *Artemia salina* L. as the test objects. The quality of bottom sediments as “good”, “satisfactory”, “bad” and “very bad” was determined depending on the extent of the toxicity of water extractions. The study showed that, in the bay area, “good” and “satisfactory” bottom sediments predominated. Worse quality of bottom sediments to “satisfactory” was found in the Ozerko and the Chervyanoe Ozerko inlets, off the Rybachy Peninsula coast and in the Bear Cape area. “Bad” sediments were registered only in the Ozerko inlet. The results of the researches might be used in arranging ecological monitoring of the Motovsky Bay.  **Key words:** biotesting, marine sediments, Motovsky Bay, Barents Sea, *Phaeodactylum tricornutum*, *Artemia salina.*  *DOI: 10.17217/2079-0333-2016-37-31-38*  **Information about author**  **Gorbacheva Elena Anatolevna –** Knipovich Polar Research Institute of Marine Fisheries and Oceanography (PINRO), 183038, Russia, Murmansk; Candidate of Biological Sciences; Researcher of Applied Ecology and Toxicology Laboratory; gorbach@pinro.ru |
| УДК 639.29.053.8(265.53)  **A.A. Dulenin**  **EVALUATION OF RESOURCES AND USE OPPORTUNITIES FOR ALGAL BELT  OF THE SEA OF OKHOTSK CONTINENTAL COAST WITHIN KHABAROVSK KRAI**  The algal stocks under specific conditions of the northwestern Sea of Okhotsk should be calculated as the result of multiplication of the commercial colony frequency, average relative biomass and survey areas. The main commercial species is *Saccharina gurjanovae*. The volume of commercial stocks over an eight-year observation period has been calculated, forecasting principles have been determined. The second perspective commercial species is *Pseudolessonia laminarioides*. At present, the species is included in the Red Data Book of the Russian Federation. There are no objective grounds to include the species in the Red Data list. Other species of algae have no industrial development prospects in the foreseeable future. The only commercially marketable algae product is the kelp with herring caviar.  **Key words:** north-western Sea of Okhotsk, *Saccharina gurjanovae,* *Pseudolessonia laminarioides*,  resources, forecasting, commercial use prospects.  *DOI: 10.17217/2079-0333-2016-37-39-49*  **Information about author**  **Dulenin Aleksandr Alekseevich** – Khabarovsk Branch of Pacific Research Fisheries Center, 682800, Russia, Khabarovsk; Candidate of Biological Sciences, Leading Researcher of the Sovetskaya Gavan Laboratory; dulenin@mail.ru |
| УДК 582.272.7  **A.V. Klimova, A.N. Kashutin**  **EARLY DEVELOPMENT OF THE BROWN ALGA *FUCUS EVANESCENS* (PHAEOPHYCEAE, FUCALES) FROM SOUTHEAST KAMCHATKA UNDER LABORATORY-CONTROLLED CONDITIONS**  Early stages of development under laboratory-controlled conditions were investigated in the brown alga *Fucus evanescens* from Kamchatka. Reproductive thalli with mature conceptacles were collected on October 5, 2015 from the Seroglazka Bay (Avacha Bay). We observed development of *F. evanescens* in the laboratory cultures for 4 months. Differentiation of juvenile sporophytes into blade and holdfast occurred after 26 days of cultivation. By the end of January 2016 young algae in the laboratory reached 1.0-1.2 mm at length.  **Key words:** brown alga*,* Fucales, *Fucus evanescens,* laboratorycultivation, germination of zygote, development of germlings, southeast Kamchatka.  *DOI: 10.17217/2079-0333-2016-37-50-56*  **Information about authors**  **Klimova Anna Valerevna –** Kamchatka State Technical University; 683003, Russia, Petropavlovsk-Kamchatskу; Researcher of Science and Innovation Department; annaklimovae@mail.ru  **Kashutin Aleksandr Nikolaevich –** Kamchatka State Technical University; Petropavlovsk-Kamchatskу, Russia, 683003; Postgraduate; Kashutin-an@yandex.ru |
| УДК 594.35  **T.A. Klochkova**  **A REVIEW ON KLEPTOPLASTY IN MARINE SACOGLOSSAN MOLLUSKS**  This paper presents a review of scientific literature on kleptoplasty in marine sacoglossan mollusks published during 1876–2015. Based on the analysis of the existing literature and our observations, it is our understanding that the primary purpose of algal chloroplasts, which are assimilated into the animal digestive cells  (i.e. kleptoplastids), is to serve as food reserve, which is kept in alive condition. However, photosynthesis of kleptoplastids along does not provide enough food resource for mollusks’ survival during long-term starvation.  **Key words:** horizontal gene transfer (HGT), sacoglossan mollusks, green algae, kleptoplasty, transmission electron microscope, transcriptome, chloroplast.  *DOI: 10.17217/2079-0333-2016-37-57-69*  **Information about author**  **Klochkova Tatyana Andreevna –** Kamchatka State Technical University; Petropavlovsk-Kamchatskу, Russia, 683003; Candidate of Biological Sciences; Doctor of Philosophy in Biology (Ph.D.); Associate Professor of Ecology and Nature Management Chair; tatyana\_algae@mail.ru |
| УДК 582.736:581.132:581.522.4(571.122)  **E.A. Moiseeva, L.F. Shepeleva, I.V. Kravchenko**  **DYNAMICS OF PHOTOSYNTHETIC PIGMENT CONCENTRATION IN LEAVES  OF EASTERN GALEGA (GALEGA ORIENTALIS LAM.) UNDER THE CONDITIONS  OF CENTRAL TAIGA OF WESTERN SIBERIA**  One of the indicators of plant responses to changing environmental factors, the degree of its adaptation to new environmental conditions and agronomic practices is the content of photosynthetic pigments. In this regard, the aim of our work has been the study of photosynthetic potential and photosynthetic pigments of Eastern galega as one of the promising crops for introduction into the harsh conditions of the central taiga of Western Siberia. For the first time the content and ratio of photosynthetic pigments in leaves of Eastern galega (*Galega orientalis* Lam.) introduction in the conditions of central taiga of Western Siberia have been investigated. The data on ecological and morphological characteristics (photosynthetic potential, specific leaf area, specific surface chlorophyll content) are presented. It has been established that the amount of photosynthetic pigments averages from 1.3 to 1.59 per 1 g of dry mass and depends on the year of vegetation and the studied agrotechnical conditions. Our research has shown that goat's rue is a promising crop for cultivation in KhMAD (Khanty-Mansiysk Autonomous District) both in pure plantation and using microbiological fertilizer Baikal-EM1 for seed inoculation before sowing. The inoculation of seeds contributes to increasing photosynthetic potential of galega leaves 4-5 times and increasing specific leaf area of goat's-rue of the second year of life. The increase in the content of carotenoids and chlorophyll b by 2 times in comparison with the control took place. It has been found that overseeding of bean component of pea reduces the level of introduced species adaptation to soil and climatic conditions of the study area. This has resulted in the reduction of photosynthetic potential, specific leaf area, the increase of chlorophyll *a* and ratio chl. a / b and chl. a + b / Ck. The findings extend the idea of ​​the ecological and biological characteristics of Eastern galega and can be used for the diagnosis of acclimatization capacity when introduction.  **Key words:** Eastern galega, introduction, Baikal-EM1, adaptation, photosynthetic pigments, cover crop, central taiga of Western Siberia.  *DOI: 10.17217/2079-0333-2016-37-70-76*  **Information about authors**  **Moiseeva** **Ekaterina Alekseevna** – Surgut State University Khanty-Mansiysk Autonomous District – Ugra, 62841, Russia; Surgut; Postgraduate; Lapinaea\_vizit@mail.ru  **Shepeleva Lyudmila Fedorovna –** Surgut State University Khanty-Mansiysk Autonomous District – Ugra; 628412, Russia, Surgut; Doctor of Biological Sciences, Professor, Professor of Botany and Plant Ecology Chair  **Kravchenko Inessa Vyacheslavovna –** Surgut State University Khanty-Mansiysk Autonomous District – Ugra; 628412, Russia, Surgut; Candidate of Biological Sciences; Leading Researcher |
| УДК [595.384.12:591.342](265.52)  **N.A. Sedova, S.S. Grigoriev**  **A GUIDE FOR IDENTIFICATION OF FAMILIES AND STAGES OF DEVELOPMENT  OF SHRIMP LARVAE (DECAPODA, CARIDEA) IN NEAR KAMCHATKA  AND ADJACENT WATERS**  The key for identification of the development stage of shrimp larvae fromsea waters off Kamchatkaand adjacent waters is presented. Separate keys for identification of families of early and late larvae, and also a key for identification of families of larvae with the truncated development are given. The original scheme of the general structure of larvae, and also drawings of separate legs and stages of development of larvae are available.  **Key words:** larvae, stage, zoea, decapodid, family, guide, abdomen, telson, rostrum, exopodid.  *DOI: 10.17217/2079-0333-2016-37-77-84*  **Information about authors**  **Sedova Nina Anatolevna** – Kamchatka State Technical University; 683003, Russia, Petropavlovsk-Kamchatskу; Candidate of Biological Sciences; Associate Professor; Assistant Professor of Water Bioresources, Fishery and Aquaculture Chair; sedova67@bk.ru  **Grigoirev Sergey Sergeevich** – Kamchatka Branch of Pacific Institute of Geography, FEB RAS (Far Eastern Branch of Russian Academy of Sciences); 683000, Russia, Petropavlovsk-Kamchatskу; Candidate of Biological Sciences; Associate Professor, Senior Researcher of Hydrobiology Laboratory; sgri@inbox.ru |
| УДК 593.96(265.51)  **V.G. Stepanov, P.A. Fedotov, Е.G. Panina**  **CHECK-LIST OF SPECIES OF SEA CUCUMBERS (ECHINODERMATA: HOLOTHUROIDEA) LIVING IN THE RUSSIAN PART OF THE BERING SEA**  An annotated check-list of Holothuroidea species occurring in the Russian part of the Bering Sea is given. The list is based on both published and our own data and includes 34 species. For each species information on distribution is provided. An unidentified species, morphologically close to the *Cherbonniera utriculus* Sibuet, 1974 presently known only in the Atlantic Ocean, was recorded from the Bering Sea (63°45' N, 176°10' E,  3850–3900 m). It is the first record of the genus *Cherbonniera* for the Pacific Ocean.  **Key words**: holothurian, sea cucumber, Holothuroidea, synonymy, list of species, distribution, Bering Sea.  *DOI: 10.17217/2079-0333-2016-37-85-96*  **Information about authors**  **Stepanov Vadim Georgievich –** Kamchatka Branch of Pacific Institute of Geography FEB RAS (Far Eastern Branch of Russian Academy of Sciences); 683000, Russia, Petropavlovsk-Kamchatskу; Candidate of Biological Sciences; Researcher of Hydrobiology Laboratory; vgstepanov@inbox.ru  **Fedotov Pavel Alfredovich** – Pacific Research Fisheries Center, 690091, Russia, Vladivostok; Candidate of Biological Sciences, Leading Researcher; fedotovbash57@mail.ru  **Panina Elena Grigorevna –** Kamchatka Branch of Pacific Institute of Geography FEB RAS (Far Eastern Branch of Russian Academy of Sciences); 683000, Russia, Petropavlovsk-Kamchatskу; Candidate of Biological Sciences; Junior Researcher of Hydrobiology Laboratory; panina1968@mail.ru |
| УДК 005.53:004.896  **V.A. Vasyaycheva**  **USING THE AUTOMATED SYSTEM OF DECISION-MAKING AS AN ELEMENT  OF INNOVATION DESIGN** In modern managing conditions the issue of improving enterprise management and competitiveness are of particular importance. In many local articles the theoretical aspects of this problem are reflected. However, the features of acceptance of administrative decisions at the enterprises of small and medium businesses are in the way-out field. This article is devoted to improving enterprise management system through the optimization of business processes on the basis of innovative technologies and development of evidence-based recommendations for management decisions without additional funds and investments. The author suggests the use of modern economic and mathematical methods, new information technologies and decision support system (DSS) for the effective use of available resources. **Key words:** management, economic and mathematical methods, decision support systems, software implementation.  *DOI: 10.17217/2079-0333-2016-37-97-103*  **Information about author**  **Vasyaycheva Vera Ansarovna –** Samara National Research University; 443086, Russia, Samara; Associate Professor; Associate Professor of the Department of Human Resource Management; veraavasyaycheva@yandex.ru |
| УДК 332.142:330.15  **M.Y. Dyakov**  **ON ACCOUNT OF EXTERNALITIES IN ECONOMIC EVALUATION  OF THE REGION’S NATURAL CAPITAL**  The article analyzes the external effects arising from the regional natural capital as well as the problems and prospects of their economic evaluation. The basic types of externalities are described, and the principles of accounting and economic evaluation are formulated. The foundations of organizational and economic mechanism for externalities are proposed.  **Key words:** externalities, economic evaluation, natural capital, natural rent.  *DOI: 10.17217/2079-0333-2016-37-104-110*  **Information about author**  **Dyakov Maksim Yurevich** – Kamchatka Branch of Pacific Institute of Geography FEB RAS (Far Eastern Branch of Russian Academy of Sciences); 683000, Russia, Petropavlovsk-Kamchatsky, Candidate of Economic Sciences, Senior Researcher of Ecological and Economic Research Laboratory; ekftig@mail.ru |
| УДК 378.014(470+571)  **G.A. Tokareva**  **COMPETITIVE RECOVERY OF LEADING RUSSIAN UNIVERSITIES AS A STATE STRATEGY IN INNOVATION DEVELOPMENT**  The article contains the analysis of international competitive abilities of leading Russian universities, envisages the structure of elite higher education in the Russian Federation and resolves the list of rating indicators for internationally-leading Russian universities. The competitiveness of leading Russian universities is examined in the context of Russia’s economics orientation into innovative development. The measures for perfection of the rating of the universities with regard to their missions are suggested and the innovation principles for management of research and educational structures as for the main manufacturing institutions of commercialized intellectual product are specified.  **Key words:** leading universities, rating, competitive abilities, internationalization, intellectual product, innovations.  *DOI: 10.17217/2079-0333-2016-37-111-118*  **Information about author**    **Tokareva Galina Albertovna** – Kamchatka State Technical University; 683003, Russia, Petropavlovsk-Kamchatskу; Doctor of Philological Sciences; Associate Professor; Professor of History and Philosophy Chair; 683003, Russia, Petropavlovsk-Kamchatskу; Petropavlovsk-Kamchatskу Branch of Russian Presidential Academy of National Economy and Public Administration; Professor of Economic, Social and Human Sciences Chair; [tga41@yandex.ru](mailto:tga41@yandex.ru) |