**Bulletin 58**

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| УДК 629.5.031.32:537.214 DOI: 10.17217/2079-0333-2021-58-6-16  **ESTIMATION OF WIND-DRIVEN POWER PLANTS APPLICATION EFFICIENCY**  **ON MODERN SHIPS**  Rak A.N.1, Tzarenko С.N.2, Kostenko A.V.2  1Donetsk National Technical University; Artyoma Str. 58, Donetsk.  2Kamchatka State Technical University; Petropavlovsk-Kamchatskу, Klyuchevskaya Str. 35.  The overview of modern wind turbines use on ships is presented. The main calculated dependencies for assessing the efficiency and ecological compatibility of wind propulsion systems are given. The issues of using modern sails-kites as propulsion systems, as well as their use for generating electrical energy are considered. The principle of sails-kites operation is described. A methodology for determining the main design parameters is presented. The kites are designed to improve the energy efficiency of the main engines and to comply with environmental requirements in reducing emissions of harmful substances into the atmosphere.  **Key words:** wind propulsion system, generator, kite, energy efficiency. |
| УДК 621.391.821 DOI: 10.17217/2079-0333-2021-58-17-28  **SOFTWARE DEFINED RADIO TECHNOLOGY  IN THE TASKS OF RADIONOISE CONTROL**  Sivokon V.P.1, 2, Lapshov D.V.1  1Kamchatka State Technical University, Petropavlovsk-Kamchatskу, Klyuchevskaya Str. 35.  2Institute of Cosmophysical Research and Radio Wave Propagation, Far Eastern Branch of the Russian Academy of Sciences, Paratunka village, Mirnaya Str. 7.  The article is dedicated to study of the atmospheric noise properties in the range of intermediate and decameter waves in the Western Bering Sea zone, where such observations were not carried out earlier. Since it is impossible to use the radio equipment of ships for such measurements, we used devices using the technology of software-defined radio systems. The measurements were carried out along the coast of Kamchatka and made it possible to establish the characteristic temporal, spatial and frequency variations in the parameters of atmospheric noise. It was found that the radio noise intensity distributions proposed due the recommendations of the International Telecommunication Union differ significantly from the real ones. The obtained data analysis showed the possibility of realizing a decameter range of circumpolar latitudes, unfavorable for radio engineering systems – a sharp increase in the intensity of radio noise due to the coincidence in time of several thunderstorm activity foci and a simultaneous decrease in absorption in the ionosphere.  **Key words:** atmospheric noise, thunderstorm activity, software-defined receivers, operability of radio systems. |
| УДК 664.952:579.676:597.555.5 DOI: 10.17217/2079-0333-2021-58-29-42  **EFFECT OF LACTIC ACID BACTERIA ON DRIED SAUSAGES QUALITY MADE  FROM BLUE WHITING: PREMILINARY STUDY**  Glukharev A.Yu, Demid A.V., Churilina A.S., Barabashina S.I., Volchenko V.I.  Murmansk State Technical University, Murmansk, Sportivnaya Str. 13.  The estimation of effectiveness of using lactic acid bacteria (LAB) strains – two *Lactobacillus* and one *Streptococcus* – as potential starter cultures in the production of dried sausages from blue whiting (*Micromesistius poutassou*) was given in the work. The biochemical activity of the LAB strains was monitored by changes in pH, total acidity and the content of non-protein and amine nitrogen. It was found that when modeling the production process of dried fish sausages using *L. casei* and *Str. thermophilus*, it was not possible to achieve the desired effect, but the use of *L. plantarum* provides a decrease in pH, an increase in total acidity and an improvement in the organoleptic properties of the finished product. It is shown that the best microbiological growth in experiments was demonstrated by the strain of *L. plantarum*. Further work is needed to optimize the conditions for the development of the *L. plantarum* strain, selected after the first stage of research, in order to improve its useful functions in the production of dried fish sausages.  **Key words:** lactic acid bacteria, blue whiting, dried sausages, *Lactobacillus, Streptococcus thermophilus.* |
| УДК 664.952:634 DOI: 10.17217/2079-0333-2021-43-55  **SUBSTANTIATION OF SAUCE TECHNOLOGY USING VEGETABLE RAW MATERIALS PROCESSING PRODUCTS TO INCREASE THE NUTRITIONAL VALUE  OF FISH SEMI-FINISHED PRODUCTS**  Titova I.M., Mosharova M.E.  Kaliningrad State Technical University, Kaliningrad, Soviet Avenue 1.  The research on the justification of sauce technology to increase the nutritional value of fish semi-finished products is represented. The optimal ratio of the sauce components (apple sauce, obtained from pomace during direct-pressed juice production, and tomato puree) according to organoleptic parameters, dry matter content and viscosity has been established. A comparative analysis of the rheological characteristics of the developed sauce with a sample used in industry is carried out. The changes in the viscosity index of the sauce depending on different temperature technological modes are investigated.  **Key words:** viscosity, fish prepared food, tomato sauce, apple pomace, apple sauce. |
| УДК 595.371(265.51)"2013" DOI: 10.17217/2079-0333-2021-58-56-70  **SPECIES COMPOSITION AND DISTRIBUTION OF NON-COMMERCIAL CRUSTACEANS OF THE KAMCHATKA GULF SHELF IN 2013**  Blokhin I.A.1, 2  1Kamchatka Branch of the Russian Federal Research Institute of Fisheries and Oceanography (KamchatNIRO), Petropavlovsk-Kamchatsky, Nabereznaija Str.18.  2Kamchatka State Technical University, Petropavlovsk-Kamchatsky, Klyuchevskaya Str. 35.  The distribution of settlement density and biomass of non-commercial crustaceans in the shelf zone of the Kamchatka Gulf in 2013 based on the materials of 23 dredging stations was shown. 130 species of non-commercial crustaceans belonging to 5 taxonomic groups were identified. The most abundant stocks of non-commercial crustaceans were depths from 150 to 200 m. In the northern part of the Kamchatka Gulf near the Kamchatka River mouth a biocenosis has been preserved, identified earlier by A.P. Kuznetsov in his research, and according to the results of our research conducted in the central part of the Kamchatka Gulf shelf at a depth of 186 m, another biocenosis with amphipod dominance can be identified. The cold-water species of the boreal-arctic complex predominate in the shelf zone of the Kamchatka Gulf.  **Key words:** amphipods, biomass, biocenoses, zoogeographic characteristics, isopods, cumin crayfish, spatial distribution, settlement density. |
| УДК 582.272.462 (571.66) DOI: 10.17217/2079-0333-2021-58-71-86  **CYTOLOGICAL AND CHROMOSOMAL FEATURES OF *ALARIA* SPECIES (LAMINARIALES, PHAEOPHYCEAE) FROM KAMCHATKA**  Klimova A.V., Klochkova T.A.  Kamchatka State Technical University, Petropavlovsk-Kamchatskу, Klyuchevskaya Str. 35.  We present new data on cytology and karyology of representatives of the genus *Alaria* from the eastern Kamchatka. Since, despite morphological differences, taxa previously reported from this region as *A. angusta* and *A. marginata* turned out to be genetically identical and conspecific to *A. esculenta*, we substantiated their independence as intraspecific taxa, *A. esculenta* – f. *angustifolia* and f. *latifolia*, respectively. Cytochemical studies showed that different forms of *A. esculenta* have different oligosaccharide composition on the surface of oocytes and female gametophytes, i. e. during life cycle stages that ensure maintenance of species heterozygosity and, possibly, reproductive isolation of its forms. In Asian region, *A. esculenta* has a haploid chromosome number, which is half from that recorded from the Atlantic and Arctic regions, 14 instead of 28, suggesting that northwest Pacific is the center of *A. esculenta* origin and its settlement in the World Ocean.  **Key words:** Kamchatkа, karyotype, FITC*-*lectins, chromosome number, *Аlaria esculenta* complex,Laminariales. |
| УДК 504.5:574.24(282.247.41) DOI: 10.17217/2079-0333-2021-58-87-103  **The state of water protection zones of the Volga and Kizan rivers  in high ecological risk areas**  Melnik I.V.1, Vasileva E.G.1, Filipova M.V.2  1Astrakhan State Technical University, Astrakhan, Tatishcheva Str. 16.  2Ruse University Angel Kanchev, Bulgaria, Ruse, Studentska Str. 8.  The growing anthropogenic load on fluvial hydrosystems is now becoming a real threat. The aim of the research was to assess the state of vegetation and soil in the territory of water protection river zones in the delta part of the Volga river in high ecological risk areas. In order to achieve it, standard methods of biotesting and bioindication were used in the territories of two water protection zones. The results of the research showed that the soils of Sokolovsky Oil Pits are the most toxic of all: the germination capacity of the test object (watercress) is 6 times lower than that at other monitoring sites. In summer and autumn, all monitored sites demonstrated the maximum rates of occurrence and abundance of typical representatives of the local flora these are camel thorn (*Alhagi pseudalhagi*) and greater burdock (*Arctium lappa*). In 2018–2020, indicators of abundance of all thirteen-plant species registered in the oil-contaminated area (Sokolovsky Oil Pits) have a positive trend, the area gets more and more overgrown.  **Key words:** bioindication, biotesting, water protection zone, heavy metals, phytotoxicity, phytocenotic composition. |
| УДК 598.2:591.552(571.66) DOI: 10.17217/2079-0333-2021-58-104-119  **COLONIAL SEABIRDS OF MEDNY ISLAND  (COMMANDER ISLANDS)**  Pilipenko D.V.  Nature and Biosphere Reserve Commander Islands named after Marakov S.V., Kamchatka Territory, Aleutskiy District, Nikolskoe village, 50 years of October Str. 31.  The results of colonial seabird surveys on Medny Island were presented and the changes in numbers and distribution over the past 20–30 years were analyzed. The number of colonies on the island has not changed. The total number of individuals belonging to19 species is more than 200 thousand pairs. The colonies are distributed on the island relatively evenly along the whole coast and are based on five species – northen fulmar *Fulmarus glacialis*,black-legged kittiwake *Rissa tridactyla*, red-legged kittiwake *Rissa brevirostris* and two species of guillemots. The most numerous species is Northen fulmar. The abundance of the common guillemot *Uria aalge* has noticeably increased. The glaucous-winged gull *Larus glaucescens*, the crested auklet *Aethia cristatella*, the moth horned puffin *Fratercula corniculata* and the tufted puffin *Lunda cirrhata* has increased less. The number of parakeet auklet *Cyclorrhynchus psittacula* has decreased. There was not found significant changes for the rest of species.  **Key words:** Commander Islands, colonial seabirds, Medny Island, ornitofauna, location of colonies, number. |