**Vestnik 55**

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| DOI: 10.17217/2079-0333-2021-55-6-16  **Substantiation OF OPTIMAL METHOD OF ATLANTIC HERRING’S SALTING process FOR SMALL-business PRODUCTION**  Alshevskaya M.N., Anistratova O.V.  Kaliningrad State Technical University, Kaliningrad, Soviet Avenue Str. 1.  In this paper, we offer technological solution to produce low-salted Atlantic herring (*Clupea harengus*) for small-business production. The method of salting in buckets consisted of two stages, including salting herring in saturated brine at a ratio of 70 (fish) : 30 (salting solution) and subsequent storage in isotonic solution. This allows speeding up the technological salting process by 2 times in comparison with the finished unsaturated method in an aqueous solution with 15% salt concentration. The possibility of secondary use of brine is shown. The shelf life of 14 days at (4 ± 2)oC was recorded for the low-salted products from Atlantic herring (*C. harengus*) with a mass fraction of salt (5 ± 0.5)% produced by an interrupted saturated salting method using secondary brine. The organoleptic parameters of salted Atlantic herring during the entire storage time corresponded to GOST 815 “salted herring”. Indicators that characterize the degree of maturation of salted herring, such as buffering and form-titrated nitrogen, were optimal. A technological scheme to produce low-salted herring using secondary brine and isotonic solution was developed. The proposed production technology allows to produce a high-quality low-salted product and is economically less expensive in comparison with the traditional salting method.  **Key words:** finished salting, isotonic solution, quality indicators, interrupted salting, Atlantic herring, brine. |
| DOI: 10.17217/2079-0333-2021-55-17-28  **STUDY OF FERMENTATION PROCESS OF BAIKAL OMUL  WITH THE USE OF LACTIC ACID BACTERIA**  Nikiforova A.P., Khazagaeva S.N., Khamagaeva I.S.  East Siberia State University of Technology and Management, Ulan-Ude, Klyuchevskaya Str. 40v, bldg. 1.  The article describes fermentation process of the Baikal omul with the bacterial concentrate containing *Lactobacillus sakei* LSK-104. pH and microbiological analyses were used as indicators of biochemical activity of lactic acid bacteria. As found, during fermentation of omul, pH of the muscle tissue in the experimental sample decreased faster and reached 5.05 at 14 days of fermentation, while in the control sample the pH value was 6.28. It can be explained by the formation of organic acids during the fermentation with lactic acid bacteria *L. sakei* LSK-104. In this case, the number of viable cells reacheed a maximum value of 1011 CFU/g. The lactic acid fermentation process in brine proceeded more intensively than in the muscle tissue. The data obtained in this study expand our understanding of the adaptive mechanisms that ensure survival of *L. sakei* LSK-104 under unfavorable cultivation conditions.  **Key words:** Baikal omul, lactobacilli, lactic acid bacteria, fish, fermentation, *Lactobacillus sakei.*  DOI: 10.17217/2079-0333-2021-55-29-40  **INFLUENCE OF CO2 EXTRACTS OF MINT (*MENTHA PIPERITA* L.)  AND CLOVE (*SYZYGIUM AROMATICUM* L.)  ON THE OXIDATIVE STABILITY OF SOYBEAN OIL**  Kalenik T.K. 1, Darwish F. 1, Alradzhab M. 1, Razgonova M.P.2, Senotrusova T.A. 1, Motkina E.V. 1  1Far Eastern Federal University, Vladivostok, Russky Island, FEFU Campus, building , M(25).  2N.I. Vavilov All-Russian Institute of Plant Genetic Resources, Saint-Petersburg, B. Mors- kaya Str. 42, 44.  Study on the effect of supercritical extracts of mint (*Mentha piperita* L.) and clove (*Syzygium aromaticum* L.) on the oxidative stability of soybean oil is presented. Extracts were obtained using supercritical fluid extraction and then added to soybean oil at two different concentrations. The effect of the extracts on the stability of soybean oil during the storage period was studied by determining the peroxide and acid values. Mint extract (*M. piperita*) was analyzed by HPLC with MS / MS identification. A total of 21 different biologically active components were identified in *M. piperita* SC-CO2 extracts. The oxidative stability of the soybean oil samples enriched with supercritical extracts of clove and mint was higher than in the control sample (without addition of supercritical extracts). Supercritical extracts can be recommended as a source of natural antioxidants to extend the shelf life of vegetable soybean oil.  **Key words:** HPLC-MS/MS, cloves (*Syzygium aromaticum* L.), mint (*Mentha piperita* L.), oxidative stability, supercritical CO2 extraction, soybean oil. |
| DOI: 10.17217/2079-0333-2020-55-41-72  **MARINE BENTHIC ALGAE FROM COMMANDER ISLANDS (REVISION 2021).  II. RHODOPHYTA**  Klochkova N.G., Klochkova T.A., Klimova A.V.  Kamchatka State Technical University, Petropavlovsk-Kamchatskу, Klyuchevskaya Str. 35.  We present results of revision based on our personal data and reports published from 1889 to 2020 on the red algal species composition from the Commander Islands. The general list includes 150 species. Six species are reported for the first time, including *Phymatolithon lamii*, *Neoabbottiella valentinae*, *Callophyllis beringensis*, *Kallymeniopsis verrucosa*, *Velatocarpus kurilensis*, and *Mazzaella hemisphaerica*. These species are illustrated by photographs of samples collected by us from Bering Island in September 2020. Another 15 red algal species reported from this area by different authors we attributed by us to doubtful and incorrectly identified taxa. The list of valid species is organized similarly to that in our recent paper on flora of the green and brown algae from the Commander Islands [Klochkova et al., 2020]. In the list, we cite papers containing information on species records from this area. For all species, information on their distribution frequency, depth, and some ecological and biological features are provided. It is shown that in contrast to many other regions of the Russian Far East, the Commander Islands are well studied from phycological and floristic aspects. This is due to seasonal and year-round investigations carried out in this region in different time periods, a thorough diving survey on the coastal area and more complete study on microepiphyte species composition, including microscopic red algae.  **Key words:** species composition, macroalgae, Commander Islands, Rhodophyta. |
| DOI: 10.17217/2079-0333-2021-55-73-88  **DISTRIBUTION OF ALASKA POLLOCK (*GADUS CHALCOGRAMMUS*)  IN NORTHERN PACIFIC OCEAN: A RESULT OF INFLUENCE  OF ECOLOGICAL FACTORS DURING EARLY DEVELOPMENT**  Grigoryev S.S.  Kamchatka Branch of Pacific Geographyсal Institute, Far Eastern Branch of Russian Academy of Sciences (FEB RAS), Petropavlovsk-Kamchatsky, Partizanskaya Str., 6.  The hypothesis of invasion of Alaska pollock (*Gadus chalcogrammus*) to the Northern Pacific Ocean during the Bering Strait opening is discussed. Alaska pollock, a fish from the family Gadidae, is the most widespread and abundant commercial species in northern part of the Pacific Ocean. It is considered that the northern part of the Atlantic Ocean was the center of formation of Gadids in the Northern hemisphere. Species *Gadus morhua* and *G. chalcogrammus* differ on their features of early ontogenesis and requirements to environment conditions. Life history of the Atlantic cod *G. morhua* depends on the systems of warm currents in the northern part of the Atlantic Ocean. Unlike Northern Atlantic, all space of northwest part of the Pacific Ocean is occupied by the water of subarctic structure mass. The species *G. chalcogrammus* occurs more deep-water, differ by benthonic spawning (from 100 to 500 m of bottom depth) and embryonic development at lower (about 0ºC), even negative, water temperature at surface. During their development, the eggs drift under the influence of cold currents. Suitability of early ontogenesis of Alaska pollock to severe conditions promoted its survival and a wide distribution in northern part of the Pacific Ocean during evolution.  **Key words:** invasion, Alaska pollock, spawning, early development, North Atlantic, North Pacific, water temperature, currents, cod. |
| DOI: 10.17217/2079-0333-2021-55-89-101  **ASSESSMENT OF HEAVY METALS POLLUTION IN THE PLANTS  OF PETROPAVLOVSK-KAMCHATSKY (KAMCHATKA TERRITORY) IN 2017**–**2020**  Avdoshchenko V.G., Klimova A.V.  Kamchatka State Technical University, Petropavlovsk-Kamchatskу, Klyuchevskaya Str. 35.  In this work, we identified the content of zinc, copper, lead, and cadmium in the leaves of plants, including *Artemisia vulgaris kamtschatica*, *Betula ermanii*, *Calamagrostis canadensis* and *Salix udensis* collected from the territories of Petropavlovsk-Kamchatsky in summer 2020. Comparative analysis of changes in the accumulation levels of heavy metals in species-indicators from the urban environment, such as *A. vulgaris kamtschatica* and *S. udensis*, collected from 2017 to 2020 was provided. In general, copper content in plants from the city varied slightly over the entire investigation period. Zinc accumulation in the plants of the herbaceous and woody layers increased in 2020. The opposite trend was recorded in the accumulation of lead and cadmium for species-indicators. Their content in the vegetation cover of the city decreased by half from 2017 to 2020. In 2020, the total heavy metals pollution of plants of the herbaceous layer was assessed as weak; in previous years, it corresponded to an average degree. A similar situation was recorded for the tree layer. In Petropavlovsk-Kamchatsky, one of the most polluted sites was “Bus terminal 10 km”.  **Key words:** cadmium, copper, metal pollution, Petropavlovsk-Kamchatsky, lead, urbanized territories, phytocoenosis, zinc, *Artemisia vulgaris kamtschatica*, *Salix udensis.* |