**Bulletin 61**

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| УДК 631.4(571.66) DOI: 10.17217/2079-0333-2022-61-6-15  **PROSPECTS FOR BROWN ALGAE *FUCUS DISTICHUS*  USE IN FISHMEAL PRODUCTS TECHNOLOGY** Blagonravova M.V. Kamchatka State Technical University, Petropavlovsk-Kamchatskу, Klyuchevskaya Str. 35.  The research results on the development of fishmealproducts technology with the introduction of brown *Fucus distichus* as well as a broth prepared from chum salmon dressing waste as structure-regulating, flavoring and enriching components are presented in the article. The study results of Fucus algae introduction influence on limiting shear stress, stickiness and water-holding capacity of minced fish and the effect results of replacing water with broth in the dough recipe are presented. It is shown that the introduction of these additives has a positive effect on the rheological properties of fishmeal products, increasing the strength of minced meat, reducing moisture losses during heat treatment, increasing the dough elasticity for dumpling production. The technological scheme of production, including operations for the introduction of algae and fish broth, is given.  **Key words:** water-holding capacity, chum salmon, stickiness, salmon fish, mass fraction of solids, rheological properties, limiting shear stress, technological scheme, fishmealproducts, Fucus algae *Fucus distichus.* |
| УДК 591.9:598.2(571.66) DOI: 10.17217/2079-0333-2022-61-16-39  **FAUNA AND MARINE BIRD POPULATION NEAR THE SOUTH KAMCHATKA NATURE PARK COAST IN SUMMER SEASON**  Artukhin Yu.B.  Kamchatka Branch of Pacific Geographical Institute FEB RAS, Petropavlovsk-Kamchatsky, Rybakov Prospect 19a.  The study was conducted in June – July 2016 and 2021 on the southeastern coast of Kamchatka. Birds on line transects and on routes along the coastline were taken into account from the side of a small vessel (boat) and on a motor boat. We recorded 32 bird species, mainly alcids (34.4% of the species composition), larids (15.6%) and anatids (12.5%). The density of bird distribution in the water area was 25.5 individuals/km2 on average. In terms of numbers, the tubenoses and alcids (42.9% each) occupied the dominant position on the accounting transects remote from the land, and on the routes close to the shore – larids (61.5%) and alcids (23.0%). The total number of birds within the boundaries of the coastal water area of 1 280 km2 is approximately 40 thousand individuals. The basis of the population (about 60%) consists of eight species nesting in this area, each of which has more than 1 000 individuals (mainly tufted puffins and murres). The remaining 40% are species from other regions (short-tailed shearwaters migrating from the southern hemisphere, northern fulmars nesting on the neighboring territories and phalaropes during post-nesting migrations).  **Key words:** waterbirds, seabirds, population of birds, distribution, shipboard surveys, abundance, South Kamchatka Nature Park. |
| УДК 592/595(571.66) DOI: 10.17217/2079-0333-2022-61-40-64  **THE FIRST EXPERIENCE OF ASSESSING TAXONOMIC DIVERSITY,  ABUNDANCE AND BIOMASS OF INVERTEBRATES (SPIDERS AND INSECTS)  IN KAMCHATKA IN THE RIVER FLOODPLAIN BACKGROUND BIOTOPES (ON THE EXAMPLE OF THE AVACHA RIVER LOWER REACHES)**  Lobkov E.G.1, Lobkova L.E.2  1 Kamchatka State Technical University, Petropavlovsk-Kamchatsky, Klyuchevskaya Str. 35.  2 Kronotsky State Nature Biosphere Reserve, Yelizovo, Kamchatka Territory, Ryabikova Str. 48.  The parameters of the seasonal dynamics of taxonomic diversity, abundance (number) and biomass of invertebrates (insects and spiders) on 10 different in appearance test areas in the background terrestrial biotopes of the floodplain in the interfluve of the Avacha and Pinachevskaya Rivers in 2018 and 2020 were determined. The maximum indicators of invertebrates abundance (from 200 specimens to 1 thousand or more per oblique by entomological net) in different biotopes were observed at different periods, but all of them occured in the period from mid-June to mid-October, usually from mid-July to August. The absolute values are various in different biotopes. The invertebrates biomass usually grows continuously from May to July, peaks in late July or the first half of August and then declines to a minimum by November with the onset of frost and before the first snowfall. The maximum invertebrates biomass per 1 m2 (during the peak value for each biotope) in 2018 was 0.033 – 0.097 g / m2 (0.998 g – 2.9 g per mowing), the average value (*n* = 10) was 0.049 g / m2. This index was less in 2020. The average value of insect biomass for 2 seasons per conditional 1m2 of the river floodplain in the studied area was about 0.029 g. Insects predominate among invertebrates, but spiders also occupy a significant part: 18% in abundance (number) and 38% in biomass, respectively, according to the results of mowing in 2018.  **Key words:** invertebrates, biomass, interfluve of the Avacha and Pinachevskaya Rivers, insects, floodplain, abundance, spiders, number. |
| УДК 631.41(571.66-25) DOI: 10.17217/2079-0333-2022-61-65-81  **ASSESSMENT OF SOIL HEAVY METAL POLLUTION  IN PETROPAVLOVSK-KAMCHATSKY (KAMCHATKA TERRITORY)**  Avdoshchenko V.G., Klimova A.V.  Kamchatka State Technical University, Petropavlovsk-Kamchatskу, Klyuchevskaya Str. 35.  The results of determining the gross content of zinc, copper and lead in the surface soil layer, collected in Petropavlovsk-Kamchatsky, are presented in the paper. Based on them the heavy metal pollution degree assessment in different places of the city during 2017–2020 is given. It was found that almost everywhere the lead content in soils corresponded to a very high or high degree of contamination. According to the concentration of copper and zinc, the soils were classified as low and medium polluted. During 2017–2020 an increase of copper and zinc concentration in soils was registered. The dynamics of changes in lead concentration, on the contrary, was poorly expressed during 2017–2018. In 2020 a decrease in its content was found in all observed areas. According to the integrated pollution indexes PLI and NPI, the most polluted soils were identified in such areas as ‟Hospital” (2017),‟Botanicheskiy Pereulok” (2018), ‟Stadium Spartak” (2020). All city soils were characterized by a weak degree of potential environmental risk resulting from heavy metal pollution. The obtained data can be used to monitor heavy metal contamination of urbanized territories soils in Kamchatka Territory.  **Key words:** pollution, Kamchatka Territory, heavy metals, urbanized soils, Cu, Zn, Pb. |
| УДК 631.4(571.66) DOI: 10.17217/2079-0333-2022-61-82-92  **PECULIARITIES OF SOME KAMCHATKA SOILS**  **AND NECESSITY OF THEIR PRESERVATION**  Kazakov N.V.  Kamchatka Branch of Pacific Geographical Institute FEВ RAS, Petropavlovsk-Kamchatsky, Partizanskaya Str. 6.  The characteristics of four soils of the Kamchatka Peninsula that are mostly needed protection are presented in the article. Reference plots have been allocated for two of them, which are proposed for inclusion in the Red Book of Soils of Russia. Their morphology is described; photos of soil profiles, cartographies of their location are given. One of the sites characterizes ochre typical soil which is zonal for the region, the other – a rare soil on diatomite deposits. A plot located in the area of the village Sosnovka (Yelizovsky district) which earlier was the basis for the most complete description of the first soil was proposed as a reference for it. The reference for the second soil is a small relief lowering, located at the southern tip of Sredinny Range in the valley of the Plotnikov River, representing the only location of this soil on the peninsula. Each site proposed for protection is recommended to be given the protected status of a ‟Natural monument” of regional significance.  **Key words:** Kamchatka, Red Book of Soils, ochre typical soil, soil on diatomite deposits. |
| УДК 622.271.461(571.17) DOI: 10.17217/2079-0333-2022-61-93-104  **AGROCHEMICAL AND MICROBIOLOGICAL PROPERTIES OF BARZASSKY PROCESSING FACTORY ROCK DUMP SOILS[[1]](#footnote-1)\***  Serazetdinova Y.R., Dyshlyuk L.S., Fotina N.V., Osintseva M.A., Golubtsova Yu.V.  Kemerovo State University, Kemerovo, Krasnaya Str. 6.  The Barzassky district of the Kemerovo region is poorly developed by industry, but large areas of land are already subject to alienation. For the competent implementation of the process of disturbed territories recultivation, it is important to understand the degree of degradation of soil covers. Therefore, the purpose of the work was to study the agrochemical and microbiological properties of Barzassky processing factory rock dump soils. In the course of the work, soil samples from the surface layer of the dump as well as from the borders of the railway protective forest belt were studied. The studied soils of the dump are classified as slightly alkaline (average pH 7.899). The soils selected from the railway protective forest belt were subjected to acidification. The samples showed a low content of nitrogen (ammonium and nitrate – <5.0 and <2.8 mg/kg, respectively). Significant content of salinization was found. It has been established that acidification of soils in technogenically disturbed territories leads to a soil microbiota disorder and an increase of conditionally pathogenic microorganisms in them.  **Key words:** agrochemical indicators, microbiological indicators, soils, dumps, recultivation. |
| УДК 595.384.12(265.53) DOI: 10.17217/2079-0333-2022-61-105-120  **PECULIARITIES OF DISTRIBUTION OF CARIDEAN SHRIMP LARVAE  (DECAPODA, CARIDEA) IN EASTERN PART OF THE SEA OF OKHOTSK**  Sedova N.A.1, GrigorevS.S.2  1 Kamchatka State Technical University, Petropavlovsk-Kamchatsky, 683003, Russia  2 Kamchatka Division of Pacific Institute of Geography, Far East Branch, Russian Academy of Sciences, 683000, Russia  Species composition and long-term distribution of shrimp meroplankton in eastern part of Okhotsk Sea are described. Interannual and seasonal variability of qualitative and quantitative composition of shrimp meroplankton is discussed. Average abundance of larvae per station in different areas in spring varied within 1–77.5 ind./m2, in first half of summer – 13.1–133 ind./m2, in September – 1–27 ind./m2. Larvae of genera *Pandalus* and *Eualus* were most abundant in April. In summer larvae of family Crangonidae dominated above shallow waters, and Pandalidae dominated above bottom deeper than 100 m. Maximum abundance (1410 ind./m2) was observed in July. Most of larvae develop in upper layer of pelagic zone. In spring larvae were found above bottom depths more than 300 m. In first half of summer main concentrations were above outer and middle shelf, in second half of summer – above inner shelf. Late stages inhabit above bottom depths no more than 40 m.  **Key words:** shrimp, meroplankton, larvae, development, species composition, distribution, abundance, density, western Kamchatka shelf. |

1. \* (The work was carried out within the framework of the state task for research on the topic ‟Development of approaches to phytoremediation of post-technogenic landscapes using plant growth-stimulating rhizobacteria (PGPB) and ‟omix” technologies”, supplementary agreement № 075–03–2021–189/4 dated 30.09.2021 (internal number 075–ГЗ/X4140/679/4). [↑](#footnote-ref-1)