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Cephalopods: The Power of Medical Use

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Interest in organic matter (bas) derived from marine living resources is growing each year. these compounds are used as a basis for the development of new drugs, biopreparations used in food industry and agriculture, as well as the production of active food, active food ingredients and cosmetics. members of the molluscan cephalopoda category are promising items for search for new bas. in addition, other species of squid, octopus, and cuttlefish are first seen of sexual maturity, short life cycle, rapid weight gain, rapid reproductive recovery, and ability form aggregations. large-scale equipment and a wide variety of high-end species make these animals a reliable source of raw materials for large commercial production.

TYPES AND PERFORMANCE ARE POSSIBLE OF CEPHALOPODS

Modern cephalopods (category Cephalopods), i.e. number of only 800 marine species, consisting of ancient and ancient members of the genus *Nautilus*, and the highly organized squid, cuttlefish, and octopuses. Complete annual catch for cephalopods in some years greater than 4 mln t, calculated by 4% of the total catch on land 2010 and 3% in 2012 [29, 30]. Russia's Far East seas reside 82 species of cephalopods in 26 families as well four orders [6]. Where the size of the world's cephalopod catch up to about 3 million, Russia harvested only about 100000 t [1]. The need because cephalopods are growing all over the world. Zoom in capture is provided by the successful development of others fishing and fishing grounds for commercial purposes unprocessed species. According to Pierce and Portela [51], the global catch of these animals, namely reached 0.5 million t in 1950, larger than 4 million t in 2007.

The Squid

The world's wild squid contains approximately 250 species [23]. There have been 200 squid species recorded in the Pacific Ocean, but not more than 30 of which are harvested commercially. It is known that squid make up the bulk (75%) of all cephalopod catches [55]. Annual squid catch on The World Ocean has risen slightly from over 2 mln t in 2002 about 3 million in 2007 and 2012 [18]. This success can be explained in part by the construction of the Illex argentinus fishery in the southwest *Atlantic gigas* and *Dosidicus* east of the Pacific Sea [30,55]. In the Far East of Russia, 52 Types of squid are known [6]. Northwest In the Pacific Ocean, commercial fishing yields 14 species, mainly Japanese flying squid *Todarode pacificus*, neon flying squid *Omastrephes bartramii*, and magistrate armhook squid *Berryteuthis magister.* Off coast of *Primorskii krai*, shares of Japanese flying squid estimated at 300000 t. Less than good economic conditions, seizures of flying aircraft squid in the Russian economy area can reach 70000-100000 t. Total amount of magistrate's biomass the armhook squid is about 2 million, however The annual catch of this species is not greater than that 90000 [7].

Cuttlefish

The cuttlefish family consists of approx. 100 species [23]. Large stocks of commercially cuttlefish species that are commercially viable focus on warmth regions of the World Ocean. Their perfect catch is that about 12-16% of the total global capture of cephalopods [56]. According to the Food and Agriculture Organization of the United Nations (FAO), earth cuttlefish caught in certain built years 210000 t. In addition to fishing from natural resources, planting of these cephalopods has also improved in recent years [65]. Six species of cuttlefish live the Russian Far East seas [6]. Large cuttlefish *Sepiella japonica* is rare in Russian waters, and the small cuttlefish *Rossia pacifica* does not create a large shares. In the spring, the small cuttlefish is *Sepiola birostrata* forms a merger in Peter the Great Bay, where it can be caught by fixed and gill nets [7]. Because for lack of significant stocks, cuttlefish is not harvested commercially in Russia.

Octopuses

Earth's octopus animals number about 250 species [23]. Large

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fishing grounds these cephalopods are found in the northeast Pacific Ocean and eastern eastern Atlantic water [30]. The largest part of the octopus catch is represented by *Octopus vulgaris.* For example, in Japan, the annual catch is 60000-100000 t. Long The Eastern seas of Russia are home to 24 species of octopus [6]. Special octopus fishing in Russia almost non-existent; the great octopus of the Pacific Enteroctopus dofleini (= Octopus dofleini) and chestnut octopus Octopus conispadiceus is harvested as a by-catch fish [1]. Of all the octopus, E.dofleini is the largest in size. According to the FAO [56], body weight is the mollusk weighs from 2 to 10 kg, while adults with a body length of 3 m weigh over 50 kg. According to some sources, the weight of a large octopus can weigh up to 272 kg [37]. Large and growing cephalopod sizes capture can cause environmental damage in the area of areas where they are processed [41]. It was noted that depending on the type of material, the waste of the process of filling the industrial product may be removed 7% [14] to 35% or more animal weight [41]. Waste efficiency can be improved, and the release of a marketable product, in addition to edible portions, it has increased significantly through the use of many processing materials for the production of physical activity [49]. Biodiversity research (BASs) from squid, octopus, and cuttlefish are almost never found in Russian biomedical literature, apart from the wide variety of these animals namely seen as well as enough stocks centered on the Far East Sea in Russia. In at the same time, these activities are carried out diligently abroad because it is possible to get a promise drugs to treat four patients infectious and somatic diseases. The Far East is considered to be the center for the study of marine biopolymers in Russia because of the natural resources of the sea in this regard region and large number of scientific organizations. Results of a survey conducted by staff of Pacific Fisheries Research Center (TINRO Center), iSomov Research Institute of Epidemiology and Microbiology, Research Institute of Medical Climate Treatment and Rehabilitation, and Pacific State Medical University published in many papers and sought for patents by the establishment of an active food supplement (BADS) Tinrostim, created on the basis of peptides from the nerve tissue of the magister armhook squid, have become very popular in Russia [2, 5, 9]. Pre-clinical trials of Gangliin synthetic drugs, also based on these peptides, have been done recently. The fat comes from the liver of the magister the squid armhook has been suggested as a source of unsweetened fats [4]. Cephalopods are known to contain different biological properties, usually in high concentrations. As the Many species do not have an outer shell, using various means of protection, including toxins reduce deer and enemies, and liquid ink to avoid being attacked by a hunter [23]. Studying the properties of these materials is of great interest.

WORK OF ANTIXIDANT OF BASs FROM CEPHALOPODS

Antioxidant activity (AOA) is one of the most common important aspects of life-sustaining chemicals, as many diseases are associated with oxidative stress: infectious processes, atherosclerosis, carcinogenesis, ischemic and recurrent tissue damage, diabetic processes, etc. causes of food spoilage and cosmetics. Over the past decade, the largest number of jobs in anti-BAS structures from organs, tissue, and ink for cephalopods is published abroad [22,25,68]. Top AOA defined is melanin-free ink from squid *Loligo formosana*. Therefore, AOA is a molecular component of cells weight less than 3 kDa was higher than that with molecular weight of 3-10 and more than 10 kDa [68]. An edible film that is not harmful to humans protects the food from spoilage and drought created on the basis of gelatin based on the skin of pig *D. gigas* [31]. Peptides from cephalopods are they are able to share electrons and binding metals show antioxidant activity. These peptides suppress the toxic effects of free radicals and prevent lipids pools and DNA damage to cells that occurs due to oxidative stress [16]. Antioxidant properties are also described in cephalopod magazine. For example, AOA for chitosan from cuttlefish *Sepia cobiensis* used in a dose of 10 mg / mL range between 50.68-74.36%. Authors has shown this combination as a powerful natural antioxidant, as well as a dietary supplement and promising drug in the pharmaceutical industry [53]. In in vitro tests have shown that polysaccharide from squid ink prevents cyclophosphamide-induced compression in the organs (liver, heart, lungs and kidneys) animals that have acquired immunosuppressive agents [47]. Polysaccharide reduces Fe3 + excessively and effectively reduces DPPH radical hydroxyl. In addition, it produced a cytoprotective effect on DNA plasmid pEGFP-Nl. According to the authors, this polysaccharide can be It is recommended to reduce the side effects of chemotherapy in cancer patients. Polysaccharides from cephalopods have been shown to have high AOA similarity those common antioxidants are still commercially available. Polysaccharide extracted from cuttlefish *Sepia aculeata* has been shown to be a dose-based antioxidant function. Number of DPPH radicals, superoxide, and hydroxyl a with IC50 equal to 5.22 μM shown the highest function of ACE inhibition. In vivo use of peptide at a dose of 10 mg / kg created a great deal decreased systolic blood pressure in mice with spontaneous hypertension. Moreover, its effect in this case was similar to that of Captopril.

EFFECTS OF BASS OUT CEPHALOPODS IN LIPID METABOLISM

Among the causes of heart disease, atherosclerosis, which is often associated with dyslipidemia (DLP), is the best. Statements belong to too manya common and effective category of applied medical staff about this disease. However, about 30% of patients with DLP do not care. In addition, in some cases statins have a negative effect on People also argue with others patients. In this regard, the search for a novel is harmless and active agents to be used in hypolipidemic therapy remains an urgent goal. BASs studies from cephalopods create opportunities to find real agents with lipid-lowering buildings [43, 48]. A study of this action by cuttlefish ink, which was given to mice with diagnostic hyperlipidemia with equal values of 50 and 200 mg / kg, showed a significant reduction in total cholesterol levels, triglycerides, and lowdensity lipoproteins, as well as increased levels of high-density lipoproteins in the blood serum of these animals [43]. At the same time, the level of malondialdehyde decreased and superoxide dismutase and glutathione peroxidase activity increased in serum and liver. In a study of hypolipidemic studies the muscle action of squid T. pacificus, the feed of test mice infused with 0.1% cholesterol and 5% of the tissue associated with this squid within 4 weeks. Control animals are generally fed feed. As a result, a significant decline in the level of phospholipids, total cholesterol (50%), and triglycerides (20%) were recorded in mouse serum. Sewage disposal of acid sterols was high in mice treated with squid homogenate tissue [48]. The the authors suggest that the hypolipidemic effect of protein found in squid caused by a decrease in absorption of bile acids in the small intestine and inhibition of liver lipogenesis. And, it was note that the hypolipidemic effect of homogenate of squid tissue can rise when the fat is removed. The result has been shown to be absent or lack of dietary cholesterol in the diet of rats. Ermolenko et al. [4] established the process of complex processing of liver lipids from magistrates forearm. The authors have found three formulas that contain a variety of elements and different body functions. Two parts: full with unsaturated, alkyl glycerol ethers and concentrations of omega-3 polyunsaturated fatty acids The total eicosapentaenoic and docosahexaenoic acid content of 46% was separated. Available arrangements have a fixed format and can be used to prevent various disease processes and treatment of patients with these diseases.

ANTIBACTERIAL, ANTIFUNGAL, AND THE ACT OF LIFE BAS FROM CEPHALOPODS

Increased tolerance of causative agents of infectious diseases on antibiotics can make the drug ineffective against common diseases. This a depressed opinion motivates researchers to seek out bad non-toxic chemicals or low-toxic chemicals with advanced pharmaceutical properties and novel methods, where the pathogen will not grow resistant [24, 62]. The research from various countries shows that Cephalopods are a very rich source of new antimicrobial compounds in which species of antimicrobial microorganisms are currently used. the medical practice can be easily infected. Small germs cause constipation or prolonged stay infectious processes in humans are often preferred such as experimental bacteria: *Staphylococcus aureus*, *Pseudomonas aeruginosa*, *Escherichia coli, Enterococcus faecalis*, *Klebsiella sp., Salmonella* sp., Etc. In most subjects, the disk diffusion test is used as one of the oldest and most advanced common ways to test sensitivity to antibiotics. Appropriate for many studies viruses, including bacteria with complex requirements for healthy eating. This method varies from various types of antimicrobial agents and do not requires special equipment. The effectiveness of antibacterial agents under study is measured by testing control of (normal) bacterial species [13]. Antibacterial activities to prepare found in cephalopods depending on the species, focusing on extraction or hybridization taken from it [46, 64, 69], pH measurement [50], type of extraction [33], molecular weight of active agent [17], the acetylation rate of biopolymers [17], and the antioxidant power of extracted BAS isolated from it [28]. The action of antimicrobials for BASs is assessed by size measurement of the area of growth inhibition in the experimental culture. The diameter of the growth barrier is more than 20 mm shows high bacterial sensitivity to a BAS tested. Scope of growth an area of block within 15-20 mm allows one to view a sensitive microorganism; place smaller than 10-14 mm indicates a resistant microorganism. Results of a study of antimicrobial activity of BAS is based on cephalopod in relation to micro-organisms by repeatedly resisting existing antibiotics they deserve high esteem. Infections caused bacteria that produce a wide range of beta-lactamases are associated with high morbidity as well death. Beta-lactam antibiotics are common used for the treatment of bacterial infections. However, beta-lactamases have broader properties of activities and familiar carbapenemases destructive cephalosporins are produced by bacteria that inhibit effective treatment [58].

Items from cepalopods contain pathogens the broad range of beta-lactamases is sensitive [33]. Therefore, the extraction of crude hexane is an ink of squid Loligo duvaucelii showed superior activity against *E. coli* and *Klebsiella pneumoniae*. The size of area of inhibition of E growth. coli was 18 mm; because K. *pneumonia* was 23 mm. Minimum prevention the concentration of extraction in both types of microorganisms was 2.5 mg / mL on average; the bacteriostatic concentration was 1.25 mg / mL. Tuberculosis agent, Mycobacterium tuberculosis, and has developed more resistance to first- and second-line drugs currently in use. In in this regard, work in TB research the action of methanol extraction from cuttlefish ink Sepiella inermis is of great interest [54]. Exit structure was found to include omega-3 fatty acids and lipids disrupt the microbial membrane [26]. Varieties of chemicals, including polysaccharides, are also described as active extraction agents hydrolysates from cephalopods. Immetics of glycosaminoglycans and heparin / heparan sulfates in them offer a variety of natural functions in binding and others macromolecules: arrange Matrix structure above cells in connective tissue, control of homeostasis, the binding of plasma proteins in the blood wall artery, I cell body control, differentiation, and integration. In this regard, research has been done on where heparin and glycosaminoglycans such as heparin and heparin are found in Euprimna berryi contains specific offspring [61]. The authors use Bacillus subtilis, E. coli, P. aeruginosa, S. aureus, Shigella flexneri, and fungi Aspergillus fumigatus, Fusarium sp., Cryptococcus neofromans, Microscopium sp., And Candida albicans as a biological test. Testing is based in the distribution of agar Method showed that both unwanted and pure examples were used all living things were tested. The authors recognize the fact that polysaccharide is released from cuttlefish is an inexpensive and effective source of highly effective antibacterial as well deadly structures. There are a few tasks assigned to the file as a result of chitosan from the drum. Chitosan is mainly found in chitin which is found in a variety of biological sources, including mollusks. According to the hypothesis in the antibacterial action machine Chitosan from squid *Sepioteuthis lessoniana*, water-soluble chitosan undermines the integrity of bacterial cell membrane by increasing its penetration, leading to cell degeneration content [64]. Unwanted chitosan molecules can cover the cells of a facial virus, thus forming an inaccessible layer around the bacteria and blocking the most important channels. This the layer obviously can block access to the main soluble bacteria, which in turn strengthens it cell wall, which contributes to the extraction of cell contents, and ultimately leads to file viral death. The antimicrobial effect of chitosan action can also be found in amino acids group of glucosamine residues instead of C2 [64]. Many authors describe antimicrobials functions extracted from cephalopods by the presence of peptides, which are important birthmark antibodies, as they not only kill microorganisms but can also mimic presenter inflammatory response. How peptides work the discovery of well-charged aminoacid residues in their structures, which combine with free radicals radicals are viruses and then enter the cell. The novel protein lolduvin-S, extracted from squid ink (*L.duvaucelii*), a molecular weight of 60 kDa, indicates L-aminoxydase activity [32] and great interest. Remnants of both gram- positive and gram-negative bacteria produce extensions spectrum of β-lactamases (e.g., *E. coli* and *K. pneumoniae*), and methicillin- and amphotericinresistant S. aureus, which cause infections in humans, proven sensitivity to lolduvin-S. Width of area of inhibition of E growth. coli and K. pneumoniae were 20 and 21 mm, respectively; minimum inhibitory concentration (MIC) of lolduvin-S against these microorganisms were 25 μg / mL. The size of area of inhibition of S. aureus was 24 mm; MIC was no greater than 3.125 μg / mL. The amount of lolduvin determines its bactericidal action in relation to bacterial-resistant strains of bacteria with an extended spectrum of β lactamases [32].Antimicrobial activity of cephalopods is also associated with other compounds different chemical origins, such as phthalate [34], which has a strong antibacterial and antifungal effect [15]. There are many different types of antifungal agents methods of operation. Still, most of them have side effects; therefore, the search for a novel works effectively and harmless drugs continue. Many studies have been it has been shown that cephalopods are a never-ending resource BAS has anti-rot properties. Anti-Candida effects of aqueous, ethanol, methanol, acetone, hexane, and butanol extract from cuttlefish ink S. aculeata as studied [20]. The positive results were available when using ethanol / methanol (2:18) discharge mixture. Proteins from the ink of squid L. *duvaucelii, lolduvin-S*, exhibits high anti-C activity. albicans [32]. This function is and is characterized by the release of methanol in ink of cuttlefish S. inermis [67]. The antiseptic properties of the extract from the cuttlefish ink are considered A. fumigatus, studied in vivo and in vitro, has always been so highly tested [28]. The authors say this impact on release antioxidant elements. The natural antimicrobial properties from cephalopods also reported. Therefore, the discharge of water from ink of S. inermis and L. *duvaucelii* prevented receding transcriptase of murine leukemia virus [52]. As mentioned above, [34] described an antibacterial drug for phthalate based on the color of square ink. Subsequently, convincing evidence of antiviral effect of bis (2- ethylhexyl) phthalate (DEHP), a A phthalate derivative derived from squid L. *duvaucelii*, to hepatitis C blood was given [35]. Incorporation of bioactive chemicals separated from natural objects and among other things, I the effect of the immune system on complex treatment is one of the most effective and effective treatment options for four patients tick-borne encephalitis (TBE). Potential research promising medical science and practice was made by Krylova [8], who tested antiviral activity of Tinrostim, a peptide derived from nerve tissue of the Far Eastern squid, which fights the TBE virus in to determine its potential use in the treatment of the disease. Antiviral activity research of *Tinrostim* was administered using various in vitro as well in vivo models. In vitro antiviral testing The function of this setting has shown to be a coefficient to inhibit the cytopathic function of the TBE virus it was 58.3% (50.0-66.7%). This level of prevention virus recurrence was recorded in the *Tinrostim* volume of 10 μg / ml. The least effective is to prevent infection peptide concentration that reduced infection The titer of at least 2 lg TCD50 was 0.1 μg / mL of *Tinrostim*. Also, Krylova [8] did an in vitro's study Combined action of *Tinrostim* and Rakuvirin, which is a drug trade. As a result, it did find that their combined use (in a ratio of 1: 1) lower the TBE virus title by 4.1 (3.7-4.5) lg TCD50 / mL and suppression of viral replication by 68.3 (61.7- 75.0)%. Effect of drug combination this is an addition. When imitating viral infection in vivo, average survival of rats treated with *Tinrostim* highly differs from that of untreated animals (z> l. 960; a < 0.05). Peptide protects 25- 35% animals mortality on average, increases the average life expectancy in 2.7-4.7 days. its action within the limits of the immune system is comparable to that of commercial drugs *Thymalin [*10]. *Tinrostim* has shown anti-toxic activity against preventable toxicity of bacterium pseudotuberculosis when administered the day before receiving a lethal dose of toxin: 76.2% of BAS-treated mice survived, and all control animals died [12]. Cuttlefish ink raises the barriers to macrophage phagocytosis, antibody response to MethA antigen for sarcoma, and TNFa levels and IL-2 in rats is stable and stable in energy [36]. Local protection of rats that have been suppressed with cyclophosphamide has been shown to increase under the influence of polysaccharide from squid ink, which renewed the integration of secret IgA into Lamina propria plasma cells. Development of- hematopoiesis in untreated cyclophosphamide mice was also reported.

ANTITUMOR EFFECTS OF BASs FROM CEPHALOPODS

An important practice in experimental pharmacy associated with the demand and development of natural therapies for the treatment and prevention of deadly tissue. Anti cancer drugs are different from other high- dose drugs Anger also meant local annoyance action. For this reason, researchers are looking for effective chemicals that have side effects. Recently for decades, anti-tumor properties of BASs taken from Cephalopods are well analyzed. Agents to be separated from squid [2,21], cuttlefish [59], and octopus [40]. Amount of activities provided for antitumor effects for extraction and hydrolysates from mollusk tissues.

The antitumor effect of extract (obtained by delipidization with acetone and extracted with Tris HCl buffer) from cuttlefish Sepia pharaonis has been read [59]. These releases show the highest anti-proliferation activity targeting chickens' fibryo larvae in quantities of 25 and 75 μg / mL [60]. The effect was based on volume. Exposure at a dose of 25 μg / mL caused cell nucleus to shrink and membrane loss integrity of other cells; at a dose of 75 μg/mL, apoptosis of multiple cells occurs. *In vitro* testing showed a cytotoxic effect of extraction from cuttlefish sepion (inner shell) in human HepG2 liver cancer cells [27]. Getting this thing very important, because liver cancer is difficult to treat and is always dangerous. Variety chemical compounds, including peptidoglycans, have been described as an active agent of extraction and hydrolysate have a protective function. Three molecules weighing 100, 80, and 40 kDa were obtained with squid I. argentinus ink [66]. One of the things with high altitude Polysaccharides content significantly increased the survival rate and life of BALB / c mice with Meth-A fibrosarcoma test when injected intraperitoneally three times in a dose of 200 μg/animal. The polysaccharide used as a prescription shows low antitumor activity, and; therefore, the authors conclude that a complex polysaccharide containing peptides also color will need to get the maximum effect. Piece cleaned from cuttlefish (S. pharaonis) an ink with a high peptidoglycan content containing a molecular weight of 10 kDa, is is proposed as a promising treatment agent for cervical cancer. A fraction that contains five amino acids (aspartic acid, serine, threonine, glutamic acid, and alanine) has been shown to be an important proapoptotic activity in the cell culture of HeLa and Caski [59, 60]. Prospects for agent development Prostate cancer treatment related studies of proapoptotic activity of polypeptide from cuttlefish (Sepia esculenta) DU-145, PC-3, and LNCaP cells (prostate cancer culture), as evidenced by decrease in volume and time [38, 39]. The studies, which were conducted using three lines of prostate cancer cells, shown 24-h exposure to DU-145, PC-3, and LNCaP peptide cells at 5, 10, or 15 mg / mL increased the percentage of cells in the first stage of apoptosis from 11.84 to 38.26% (DU-145), from 22.27 to 39.96% (PC-3), and from 5.05 to 16.11% (LNCaP), respectively [38]. It was established that the active agent of cuttlefish (S.officinalis) ink with antitumor action is tyrosinase, which significantly increases the level of caspase-3 in PC-12 cells, thereby showing a duplication of apoptosis process in cells also indicates the role of tyrosinase in the antitumor action of the ink [57]. Disruption of the normal course of cell death by a specific aspect of leukemic cells. The Proapoptotic The the effect of Tinrostim on H9 and NB4 leukemic cell values are shown [5]. As most BASs are found in immunomodulators cephalopods, their antitumor effects can be obtained by and immune participation.

RADIOPROTECTIVE EFFECT FOR BUSES FROM SEA ORGANIZATIONS

The protective and therapeutic effect of cuttlefish ink on hematopoiesis problems caused by radiation established [43]. In 60Co-lit mice, cuttlefish ink enlarged the spleen and thymus markers, number of bone marrow cells, number CFU-S and CFU-GM colonies, with superoxide release. The results of these studies has shown the mechanism of action of cuttlefish radiation protection ink is associated with an increase in granulocyto- and monocytopoiesis in bone marrow, as well as reduction Level of lipid peroxidation. In addition, melanin, which is a large ink component, which can prevent chain reactions of free radicals as their receptor. Most patients with endometrial cancer have complications caused by radiation therapy: *cystitis, proctitis,* coleitis, etc. Use of chitosan gel, which contains peptides from squid body tissues, is protected patients from subatrophic and catarrhal epithelites, diarrhea, and proctites. The rate of necrotic discharge from the wounds dropped 7- 10 days earlier again endophytic ulcers of cervical cancer intensified 8-11 days before administration groups; the onset of exophyte depletion.

EFFECTS OF TREATMENT OF WOUNDS FOR BUSES FROM CEPHALOPODS

Wound healing is a complex process that involves inflammatory response to injury, cell migration injury, proliferation, angiogenesis, and remodeling. Burning mediators: cytokines, chemicals, and growth factors, participate in all processes. BAS initiates cell function involved in rebellion and increase their emigration obtained from cephalopod release. The study of the effects of chitin separated from cuttlefish extraction (CE) in the production of flammable mediators by murine macrophages and cell migration have shown that over intensive CE stimulation promotes the production of inflammatory nitric oxide (NO) mediator in macrophages RAW custom 264.7. Production of proinfigueatory cytokines, TNFa, IL-1, and IL-6, and yanda. At the same time, the discharge is pressed production of similar cytokines in macrophages after their exposure to lipopolysaccharide. CE caused IL-8 production in mice and increased migration and invasion of fibroblasts into wound [44]. Previously [42], the use of RAW 264.7 macrophage has shown that CE increased the proliferation of murine fibroblasts and the production of TGF-hiq and VEGF, which is involved in angiogenesis and the functioning of fibroblasts, which produce large amounts of metalloproteinase 1 (MMP1) under the effect of BAS. These results provide reasons to recommend CE as an agent for the treatment of skin ulcers as well burning. It should be noted that chitin obtained from various sources are used as part of the wound to cover. In experiments with a thermal model damage to rats, chitosan gel with rapid rejuvenation effects of Tinrostim on wound and skin inflammation. The application of the gel on day 10 contributed to the closure of wound healing by 90.7 ± 5.6%, it actually led to a complete healing of wound in control, this figure was 68.4% [11]. was recordings [3]. Marine biotechnology is a new approach to targeting industrial use of marine resources. Its development is very important in medicine, as marine living resources are a rich source of BAS, which can be used to establish novel classes of therapeutic drugs, BADS, functional foods, cosmetics, Wound treatment materials, etc. Items found in seafood in general much more varied and effective than their analogues from earth's resources, because aquatic life, live in a completely different and very different place environment, produce highly efficient protective materials. Moreover, a long appearance for many marine living groups allowed them to thrive a very wide range of chemical variables. All these facts have caused modern writers an article that draws the attention of Russian biologists, physicians, and biotechnologists to cephalopods, namely, in our opinion, read less than in The world over the last decade. However, the biomass of mollusks, especially squid, are very important in Russian seas. The main fields of biomedical studies for extraction, hydrolysates, and various compounds based on these aquatic creatures are described in the underlying environment form. Oceans and seas are a source of healing novel agents, often unexpected ways of action. Slow movement of drugs found in aquatic organisms in the pharmaceutical market related to difficulties such as the insufficient development of inter-sectoral co-operation in pharmacists, biologists, molecular biologists, chemists, geneticists, biologists, and various physicians skills. Obviously, some scientific efforts have to be aimed at obtaining fragments of low molecular weight of organic chemicals (polysaccharides, peptides, etc.) and tests of their ability to bind various cell receptors will allow identification the compound districts facing a specific therapeutic effect. Promising chemicals will then be combined with a wide range of their results are limited. There is every reason to be optimistic that arrangements from cephalopods will take a suitable place for many types of treatment to par pharmaceutical drugs.

Conclusion

Cephalopods are used as a basis for creating new medicines And Its successful predators, can use a mixture of substances to subdue their prey, becoming interesting sources of bioactive compounds. In addition to neurotoxins and enzymes, the presence of antimicrobial compounds And It's Important In Medicine Because They Are successful predators, can use a mixture of substances to subdue their prey And In addition to neurotoxins and enzymes, the presence of antimicrobial compounds has been reported.

Conflict of interest

Not Disclosure

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