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The fucoidans from brown algae *Saccharina cichorioides*, *Saccharina japonica* and *Laminaria longipes*

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The obtaining of medicines based on natural substances is one of the important tasks of modern pharmaceutical industry. The polysaccharides of brown algae are non-toxic and have wide spectrum of biological activity. Fucoidans – sulfated polysaccharides of the cell-wall matrix of brown algae, have different biological effects such as anticoagulant, thrombolytic, immunomodulating, antitumor and antiviral. These polysaccharides have the various structures: they divided into pure α -L-fucans and heteropolysaccharides, which can contain the residues of galactose, mannose, xylose, uronic acids and other monosaccharides. The investigation of fucoidans is relevant for medicine, agriculture, cosmetic and food industries [1].

Brown algae of order Laminariales are widespread on the Far East of Russia. We have studied structural characteristics of fucoidans from three kinds of brown algae: *Saccharina cichorioides*, *S. japonica* (Terpeniya Bay, Sea of Japan, 2017) and *Laminaria longipes* (Shikotan Island, Sea of Japan, 1996) belonged to Order Laminariales.

The individual fractions of fucoidans were obtained using the defatting of algae by 70% aqueous ethanol, extraction of dry algal residues by solution of HCl, and anion exchange chromatography of polysaccharide extracts. In the result we isolated the one fucoidan fraction from *S. cichorioides*, two fractions from *S. japonica*, and one fraction from *L. longipes* with yields 4.1, 0.5, 0.9, and 0.35% of dry algal weight, respectively.

The structural characteristics of fucoidans, such as monosaccharide composition, sulfate content, the presence of protein and polyphenol impurities, were determined. Also all polysaccharides were investigated by the NMR spectroscopy. It was shown that the first fraction of fucoidan from *S. japonica* was sulfated (21%) and acetylated galactofucan with trace amounts of mannose and xylose; the second fraction – sulfated (30%) and acetylated polysaccharide, containing mainly fucose residues. Fucoidans from *S. cichorioides* and *L. longipes* were sulfated (32 and 36%, respectively) fucans. Polysaccharide from *S. cichorioides* also contained a trace amount of galactose residues. The protein and polyphenol impurities were absent in the all fucoidan fractions.

Thus, the brown algae *S. cichorioides*, *S. japonica* and *L. longipes* are the accessible source of fucoidans consisted predominantly from fucose, the further study of the structure and activity of which are very interesting.

REFERENCES:

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