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New fucoidan fractions from brown alga *Fucus evanescens*: structure and biological activity

*This research presents the extraction and purification of new fucoidan from brown alga *Fucus evanescens*, investigation of its structure and biological activity.*

Key words: seaweed, extraction, sulfated polysaccharides, fucoidan, activity.

The classical extraction method of sulphated fucose-containing polysaccharides – fucoidans is a time-consuming process. Different irreversible structure changes in native polysaccharides can occur during this. The purpose of our investigation was to research the possibility of an ultrasound-assisted extraction method for isolation and separation of polysaccharides of a brown alga *F. evanescens*, and to study the structures and biological activities of the new fractions of fucoidans.

The application of an ultrasound-assisted extraction method, combined with ion exchange chromatography, has allowed separation of the total fucoidan fraction (F1) from the brown alga *Fucus evanescens* into two fractions, F2 and F3, in the ratio 1:0.2. The traditionally extracted F1 differs from F3 only by the acetate groups at C3 being somewhat predominant. F2 is described as having acetate groups located chaotically, and contains galactose and xylose residues, in addition to fucose. F3 consists of fucose residues acetylated almost exclusively at C3. Therefore, the new polysaccharide extracted from preprocessed alga *F. evanescens* by ultrasound is shown to be a fucan built from a repeating disaccharide chain, where the fucose residues are connected by (1→3) and (1→4) glycoside links, sulphated at C2 and acetylated at C3 of (1 → 4)-linked α -L-fucose residues.

New fucoidan showed anticancer activity *in vitro* towards human colon carcinoma cells. Its *in vitro* anticancer activity towards human colon cancer cells was shown to be comparable to the fraction obtained by the classical method. The study of the biological activity of the new fucoidan will be continued. the fraction obtained by the classical method. The study of the biological activity of the new fucoidan will be continued.

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