Alkali Treatment of the Polysaccharides from the Cystocarpic Stage from *Iridaea Undulosa*

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Abstract: The polysaccharides from cystocarpic *Iridaea undulosa*, soluble and insoluble in 2M potassium chloride, Cs and Ci, respectively, were treated with alkali and fractionated by precipitation with increasing concentrations of KCl. They were later separated by ion-exchange chromatography, to yield fractions enriched in an α-(1→6)-glucan, agaroids and carrageenans.

Introduction

The red seaweed *Iridaea undulosa* is an important source of carrageenans. The structure of the galactans from cystocarpic and tetrasporic thalli has been studied [1]. The presence of galactans containing *L*-Gal was proved in the 2M KCl-soluble fractions from cystocarpic *Gigartina skottsbergii* after alkali treatment and further KCl precipitation [2], and also in the soluble fraction of the polysaccharides from tetrasporic *Iridaea undulosa* [3].

Herein we report the results of the alkali treatment of the 2M KCl-soluble and -insoluble fractions of cystocarpic *Iridaea undulosa* polysaccharides, and of their further fractionation by ion-exchange chromatography.

Experimental

The polysaccharide from cystocarpic *Iridaea undulosa* was fractionated with 2M KCl. Both the insoluble (**Ci**) and soluble (**Cs**) weres obtained after centrifugation, dialysis and liophylization. **Cs** and **Ci** were treated with 1M NaOH (5 h, 80°C), and their solutions, after dialysis and freeze-drying (**CsT** and **CiT**), were refractionated with KCl from 0.1M to 2M. The fractions soluble in 2M KCl (**CsTs-2** and **CiTs-2**) were subfractionated by ion-exchange chromatography on DEAE Sephadex A-50 mixed up with Sephadex G-100 stabilized on 0.2M NaCl, by elution with increasing concentrations of NaCl (up to 4 M). The constituting monosaccharides were determined by GC, after hydrolysis with 2 M TFA and derivatization to the corresponding aldononitriles and aminoalditols acetates [1,4].

Results and Discussion

The first fractionation of the polysaccharide yielded 31% of **Cs** and 62% of **Ci**. After alkali treatment, 95% of **Cs** was recovered (**CsT**), yielding four new fractions after precipitation with increasing concentrations of KCl: **CsTi-0.1**, **CsTi-1**, **CsTi-2** and **CsTs-2**. The first one (81%) is a carrageenan (88% D-Gal), with traces of L-Gal, Glc and Rha. On the other hand **CiT** was similarly fractioned with KCl, yielding also four equivalent fractions. The major one, **CiTi-0.1**, (92%) contained 93% of D-Gal and trace amounts of 3-*O*- and 6-*O*-Me-*D*-Gal. Fractionation of **CsTs-2** by ion-exchange chromatography yielded 5 main fractions. The one eluted with 0.2M NaCl contained a α-1,6 glucan and significant amounts of agaroids (26% of *L*-Gal). Subfractions **F1/s** and **F1.5/s** contained D- and L-Gal (3:1 ratio for both). The late-eluting fraction **F2/s**, contained 80% of D-Gal and minor proportions of Glc, 3-*O*-methyl and 6-*O*-methyl-*D*-Gal.

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References and Notes

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