THE ALKALINE DEGRADATION OF ZOSTERIN

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To study the fine structure of zosterin, a pectin from seaweeds of the family Zosteraceae [1], the fragmentation of its molecule by various methods has been used [2, 3]. It has been reported previously [1] that zosterin, like other pectin substances, is very sensitive to the action of alkali. We have now made a detailed investigation of the action of alkali on zosterin. The substance was treated with a 0.2 N solution of NaOH in the presence of sodium tetrahydroborate at 100°C for 5 h. In addition to low-molecular-weight decomposition products (polyols, saccharinic acids, etc.), which have not been studied in detail, high-molecular-weight and low-molecular-weight polysaccharide fractions (I and II, respectively) were formed. During the alkaline treatment, fraction (I) precipitated, while (II) remained in the solution and was separated from low-molecular-weight impurities by dialysis. As gel filtration on Bio-Gels P-60 and P-30 has shown (Fig. 1), both fractions are inhomogeneous and consist of several components differing in molecular weight.

The individual components were isolated by preparative gel filtration on the Bio-Gels mentioned; the acid hydrolysis of the majority of them gave galacturonic acid and arabinose. Arabinose is formed in the decarboxylation of galacturonic acid by alkali, as is shown by the results of the treatment of a galacturonan under the conditions of alkaline hydrolysis. Thus, the alkaline treatment of zosterin leads to its splitting into polyuronide fragments of various molecular weights.

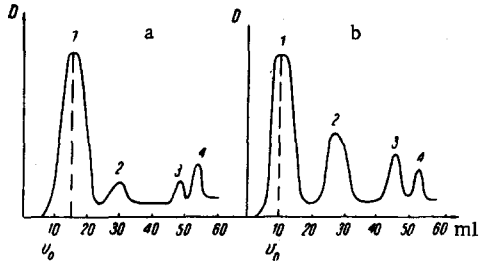

Fig. 1. Gel filtration of the products of alkaline decomposition of zosterin on Bio-Gels: a) gel filtration of the high-molecular-weight fraction of zosterin on Bio-Gel P-60. Peaks: 1) zosterin; 2, 3, 4) galacturonan fragments; b) gel filtration of the low-molecular-weight fractions of zosterin on Bio-Gel P-30. Peaks: 1-4) galacturonan fragments.

LITERATURE CITED

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