The structures of the components identified show that the process of autooxidation of cycloheptenes takes place in two directions: The first is the addition of oxygen to the double bond with the formation of epoxides, and the second is the allyl oxidation of the methylene groups. In addition to oxidative processes, disproportionation and isomerization of the products formed take place.

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PECTINS OF TOBACCO STEMS, RICE STRAW, AND KENAF CHAFF

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The ever-increasing interest in pectin substances is stimulating the search for new plant sources for industrial production. The pectin substances from sugar beet have been characterized previously [1, 2]. In the present communication we give the characteristics of the pectins from tobacco stems (I), rice straw (II), and kenaf chaff (III).

The plant raw material was first treated with hexane or acetone, eliminating the fatty-waxy fractions [3], and then the pectins were isolated as described in [4].

Information on the amounts of pectin and the results of its analysis are given below:

Raw material; HCl (N of the solution)	Pectin, %	COOH, %	Polygalacturonan, %	Mol., mass
I 0.1	2.6	17.8	79.4	48,000
0.3	3.6	14.3	56.4	27,000
0.4	1.2	8.5	34.3	13,700
II 0.3	2.5	14.0	54.9	25,000
III 0.3	1.2	13.8	54.0	12,300

After the pectin had been obtained, the residue from the raw material was used for the isolation of lignin [5]. The yields were, respectively (%): I – 30; II – 24.2; III – 47.6. On the basis of the results of the complete acid hydrolysis of the pectin its qualitative carbohydrate composition was determined. The percentages of the monosaccharides determined from the results of PC and GLC [6, 7] without taking uronic acid into account are given below:

Pectin	Rha	Ara	Xyl	Man	Glc	Gal
I	5.06	3.16	12.6	--	75.9	3.16
II	6.14	5.58	8.37	11.73	62.56	5.58

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The products of the complete acid hydrolysis of the pectins were found to contain, in addition to the monosaccharide given above, a considerable amount of galacturonic acid, which was identified by PC and electrophoresis with a marker.

Thus, it may be concluded that the pectins of tobacco stems, rice straw, and kenaf chaff are similar to that from the beet.

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CARBOHYDRATES OF THE ROOTS OF Symphytum officinale

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Common comfrey (Symphytum officinale L.) is a popular agent of the folk and scientific medicines of many countries [1-3]. We have established previously [4] that water dissolves out from comfrey roots ~40% of extractive substances, the bulk of which consists of polysaccharides [5].

To isolate, purify, and analyze these compounds, use has been made of known methods [6, 7], which amount to the following: To eliminate substances of lipophilic nature the raw material is treated with chloroform, and then the product is fractionated according to the properties of its components; namely: the alcohol-soluble polysaccharides (SSPSs) with water; the pectin substances (PSs) with 0.5% oxalic acid solution; and the hemicelluloses (HCs) with 7% caustic potash solution.

After the elimination of noncarbohydrate components, the alcohol-soluble sugars were concentrated, precipitated with acetone, and dried in a vacuum desiccator over phosphorus pentoxide. Paper chromatography in the systems 1) butanol–pyridine–water (6:4:3) and 2) ethyl acetate–acetic acid–formic acid–water (18:3:1:4) revealed the presence of galactose, glucose, and unidentified reducing sugars. A solution of aniline pthalate was used as the revealing agent [8].

After precipitation with methanol, the WSPSs, PSs, and HCs were hydrolyzed with 10% sulfuric acid solution, and their monosaccharide compositions were investigated (%):

Polysaccharide fraction	Acid sugars	Protein	Ash	PSs	Monosaccharide composition
WSPSs	5.56	4.17	8.93	49.95	Glc, Gal, Ara, X*
PSs	23.68	3.30	14.44	76.46	Glc, Gal, Ara, X*
HCs	5.94	5.91	21.23	67.65	Glc, Gal, Ara, Xyl

*Unidentified sugar, presumably a methylpentose.

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