Comparison of the Albumins of Different Cereal Grains

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We have recently described the fractionation of the albumins of barley grains by ion-exchange chromatography on diethylaminoethyl-cellulose (DEAE-cellulose) [1,2]. About 30 % of the proteins were basic and went unretarded through the column in 5 mM sodium phosphate pH 7.5. The neutral and acid proteins adsorbed were resolved into about 15 peaks by gradient elution with descending pH and ascending molarity of phosphate (Fig. 1). There were significant differences between the elution patterns corresponding to different varieties and different places of growth.

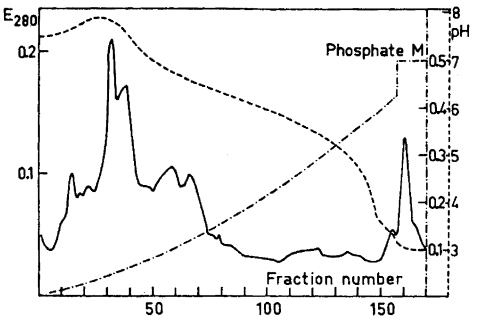

Fig. 1. Elution diagram of barley (Pirkka).

We have now compared the albumin fractions of barley, rye, oat, and summer and winter wheat with the technique developed. The experimental details are exactly as described before [1,2]. The elution diagrams are shown in Fig. 2. They are generally rather similar. However, the total amount of albumin is greater in wheat and oat and smaller in rye when compared to barley. Wheat contains a smaller proportion of acid albumins and oat contains a greater

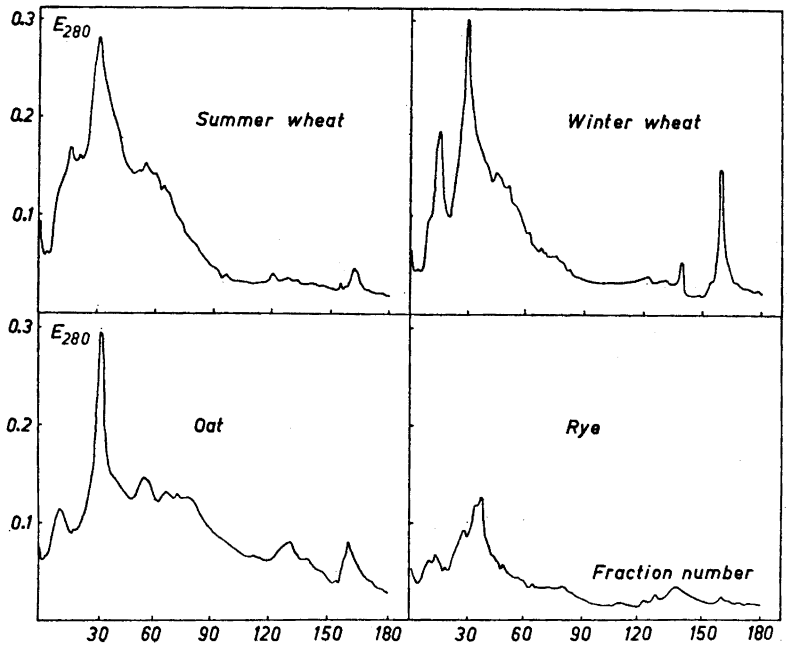

Fig. 2. Elution diagrams of summer wheat (Tammi), winter wheat (Varma), oat (Tammi) and rye (Ensi). Gradients of phosphate and pH as in Fig. 1.

proportion of moderately acid albumins than the other species. The proportion of basic, non-adsorbing proteins is smaller in oat (20 %) than in the other species (winter wheat 36 %, summer wheat 33 %, rye 32 % and barley 32 %).

1. Enari, T.-M. and Mikola, J. *Suomen Kemistilehti* **B 33** (1960) 206.
2. Enari, T.-M. and Mikola, J. *European Brewery Conv. Proc.*, Wien 1961.

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Synthesis of an Oxime Analogue to Atropin

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Atropin is the drug of choice in treatment of organophosphorus anticholinesterase poisoning. Very promising results have also been obtained with oximes such as pyridine-aldoxime methiodide or mono-*iso*-nitrosoacetone [1]. It seemed thus, without any pretention of strict pharmacological thinking, tempting to prepare an oxime closely analogous to atropin such as phenyl-glyoxylic acid tropylester oxime, see formulae I—III.

Iso-nitrosation by butyl nitrite was used as a final step in the synthesis. This method may result in *iso*-nitrosation of other groups than the methylene group of the phenyl-acetic acid. Thus the structure of the final product was studied by infrared spectroscopy.

Results. Phenyl-glyoxylic acid tropylester oxime has been prepared and the structure of the compound has been confirmed by the following results from IR-spectra.

Phenyl-glyoxylic acid ethylester oxime. The 3 500—2 500 cm^{-1} region: An absorption band at 3 220 cm^{-1} can be ascribed to intramolecular bonded OH. Between 3 180 and 2 990 cm^{-1} the CH absorption bands are found.

The 1 800—1 600 cm^{-1} region: At 1 725 cm^{-1} a strong absorption band can be ascribed to C=O and at 1 685 cm^{-1} a weaker band may indicate presence of C=N.

The 1 600—1 400 cm^{-1} region: At 1 575 cm^{-1} and 1 490 cm^{-1} weak absorption bands characteristic of the benzene ring in a conjugated system are found.

The 1 400—1 100 cm^{-1} region: At 1 300 cm^{-1} an absorption band occurs which might be ascribed to OH and at 1 195 a strong band indicates ester C—O.

Phenyl-glyoxylic acid tropylester oxime. The 3 500—1 800 cm^{-1} region: An absorption band at 2 990 can be ascribed to CH. At 2 800—2 200 cm^{-1} and 2 100—1 800 two broad bands occur which can be ascribed to $\equiv\overset{+}{N}H$.

The 1 800—1 600 cm^{-1} region: At 1 710 a strong absorption band can be ascribed to C=O and at 1 665 a weak band may be ascribed to C=N.

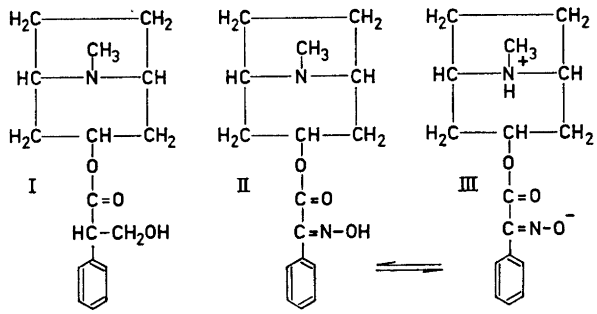

Fig. 1. I is atropin. II and III are protomeric forms of phenyl-glyoxylic acid tropylester oxime.