# The proteins of lupin seed (*Lupinus luteus*)

We report some preliminary results of investigations on the protein from lupin seed. We found that this protein consists of 3 components, associating and dissociating under the influence of pH.

Our investigations consisted of sedimentation experiments in the Spinco centrifuge and by electrophoresis experiments in the Svenson-Tiselius apparatus under the following conditions:

| *Method* | *pH* | *Ionic strength* |
|---|---|---|
| Sedimentation | 2 and 10 | 0.4 |
| | 2.3 – 7 – 8 – 9 – 10 | 0.15 |
| | 4 and 7 | 0 0.02 0.2 |
| Electrophoresis | 7.2 and 8.5 | 0.1 |
| | 2.6 – 3.7 – 8.5 | 0.057 |

In the ultracentrifuge we found:

| | |
|---|---|
| at pH = 2 | 1 component (the slowest) |
| 2.3 < pH < 6 | 2 components |
| 6 < pH < 10 | 3 components |

If a solution (1%) was kept for 1 hour at pH = 2 and afterwards brought to pH = 7 the 3 fractions of pH = 7 occurred, but the fractions with high sedimentation constant were present in much smaller concentration than when the solution was directly brought to pH = 7. Beside a reversible dissociation of the '2 heavier fractions at pH = 2, there is evidence that a more permanent change occured at this pH also.

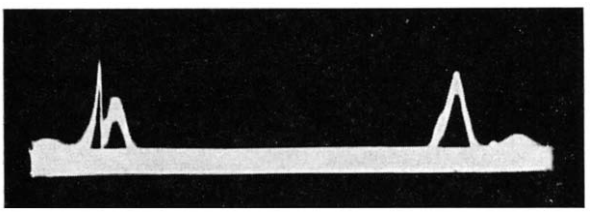

Fig. 1. Electrophoretic pattern of the unfractionated proteins. pH = 8.5, ionic strength 0.057 (Michaelis buffer).

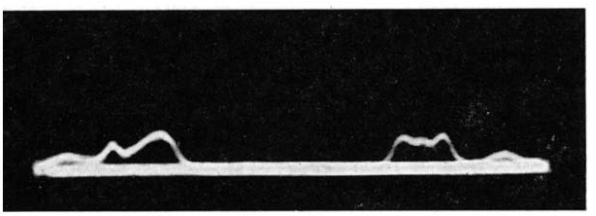

Fig. 2. Electrophoretic pattern of the protein containing less of the slowest fraction. pH = 8.3, ionic strength 0.1.

As the various fractions have not been investigated separately, only approximate values of the sedimentation constants can be given. These are about $S_I = \pm 2$, $S_{II} = \pm 7$, $S_{III} = 11 - 12$ corresponding to molecular weights in the order of 14,000, 91,000 and 200,000.

In the electrophoresis measurements we found:

| *Buffer* | *pH* | *Ionic strength* | *Number of components* |
|---|---|---|---|
| Michaelis | 2.6 | 0.057 | 1 |
| | 3.7 | 0.057 | 2 |
| | 8.5 | 0.057 | 2 |
| | 8.5 | 0.17 | 2 |
| Phosphate | 7.3 | 0.1 | 2 |

Using Michaelis buffer at pH 8.3 and ionic strength 0.1, one finds 3 components in samples from which part of the slowest fraction has been removed; under these conditions the fraction with the higher velocity splits up into 2 components.

The lupin seed protein was prepared by the method of OSBORNE as has been reported before[1].

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[1] E. M. PETRI, A. J. STAVERMAN, *Discussions Faraday Soc.*, 13 (1953) 152.

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