

The Feulgen plasmal reaction is strongly positive in the kidney fat deposits, less so in other fat droplets. It is slightly positive even without previous treatment by mercuric chloride, and this is very apparent in the kidney. Part of the fatty aldehydes seems to pre-exist to the slight oxidation by mercuric chloride.

We conclude that the abnormal fat deposits in the cells due to chronic γ -hexachlorocyclohexane intoxication are formed by a mixture of saturated and unsaturated glycerids and of lipins, mostly in an easily oxidizable or an oxidized form. Our researches do not exclude the presence of free fatty acids.

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Purification and Crystallization of Q-Enzyme

FOLLOWING the isolation by Hanes¹ of an enzyme from potato juice which catalyses the formation of amylose from glucose-1-phosphate, the discovery of a related enzyme, termed Q-enzyme, in potato juice was announced by Haworth, Peat and Bourne². This enzyme converts amylose into amylopectin. An improved method of purification was described recently by Barker, Bourne and Peat³. We now wish to report a different method of preparation which leads to a crystalline product. Our method makes use of precipitation at low temperature with ethanol from solutions of low ionic strength, followed by crystallization from ammonium sulphate solution.

Peeled and sliced potatoes are steeped in 0.7 per cent sodium hydrosulphite solution for 20 min., washed in water and minced. The juice is then expressed, centrifuged and brought to a concentration of 11 per cent in ethanol at -2°C . The precipitate is discarded and the ethanol concentration raised to 16 per cent at -5°C . to give a further precipitate. This is taken up in sodium citrate solution of pH 6.0 and ionic strength 0.01, and the solution again brought to 11 per cent in ethanol. The slight precipitate is removed and the concentration of ethanol raised to 16 per cent, the pH and ionic strength being kept constant throughout. The precipitate is taken up in citrate solution and reprecipitated at 16 per cent ethanol. The final precipitate is dissolved in citrate solution and ammonium sulphate added at 0°C . to an ionic strength of 3.8 and pH of 6.2. The precipitate is dissolved in water, and ammonium sulphate is added at 10°C . until a cloudiness appears at an ionic strength of about 3.2. The solution is cleared by adding the minimum amount of water and then cooled slowly to 0°C . Q-enzyme separates in a few hours in needle-like crystals.

The quantity of material available has not permitted more than a provisional estimate of the absolute activity of the crystals. A solution of amylose of initial light absorption value⁴ of 1.30 was half-converted into amylopectin in 12 min. (the light absorption value being used as a measure of the relative proportions of branched and linear molecules) at 20°C . in 0.2 M sodium citrate solution of pH 7.0 in a digest containing 2.2×10^{-2} mgm. of enzyme per ml. (protein determination by Kjeldahl using the factor 6.25 for converting nitrogen to protein).

If the conversion of amylose to amylopectin is assumed to be unimolecular, this corresponds to a rate-constant of 2.7 min.^{-1} per mgm. protein per ml. and to an activity for the enzyme of 2.7 in the units suggested in a previous paper⁵.

After five hours, when the light absorption value of the solution above had fallen to 15 per cent of its initial value, no reducing power could be detected; but after 24 hr. when absorption was 11 per cent, the reducing power was equivalent to an apparent conversion of 2 per cent of the initial weight of amylose to maltose. The crystals were free from phosphorylase and amylose precipitant.

A rough estimate of the weight of Q-enzyme in the potatoes used for the extraction was made by comparing the activity of the purified enzyme with that of the potato juice after proceeding to the first 16 per cent ethanol precipitation to remove interfering amylose precipitants. It was found that 2.9 mgm. was present per kgm. of potatoes.

Further details of the preparation and characteristics of this enzyme will be presented elsewhere.

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¹ Hanes, C. S., *Proc. Roy. Soc.*, B, **129**, 174 (1940).

² Haworth, W. N., Peat, S., and Bourne, E. J., *Nature*, **154**, 236 (1944).

³ Barker, S. A., Bourne, E. J., and Peat, S., *J. Chem. Soc.*, 1705 (1949).

⁴ Bourne, E. J., Haworth, W. N., Macey, A., and Peat, S., *J. Chem. Soc.*, 924 (1948).

⁵ Gilbert, G. A., and Swallow, A. J., *J. Chem. Soc.*, 2849 (1949).

Control of Cereal Leaf-Miner in Cyprus

THE tineid leaf-miner of cereals (*Syringopais temperatella* Led.) is a serious pest in certain areas of Cyprus and also in neighbouring countries, and many attempts in the past to establish control measures, chiefly by cultural methods, have not proved satisfactory, partly owing to the objection of the cultivators to any departure from their customary practices. Duplicated experiments with replicated plots carried out in various parts of Cyprus during the past three seasons have shown that *Syringopais* can be controlled by the use of D.D.T. and benzene hexachloride applied in various ways. The simplest treatment is the broadcasting of a benzene hexachloride dust on the soil at the time of sowing, so that it is mixed with the surface soil when the seed is covered and affects the aestivating first-stage larvæ before they commence attacking the crop. Various dosages have been tested: in the past season the application of a material containing 4.2 ounces of the γ -isomer per acre (294 gm. per hect.) gave spectacular control of a severe infestation on wheat and resulted in a grain yield 227 per cent of the untreated control, confirming similar results in the two previous years.

D.D.T. and benzene hexachloride applied in commercial dusts after the attack on the plants has commenced have given similar results, using the same amount of the γ -benzene hexachloride per acre or a 5 per cent D.D.T. dust at 42 lb. per acre (47 kgm. per hect.). As sprays, 2.6 oz. (73.7 gm.) of γ -isomer or 39 oz. (1.105 kgm.) of a 20 per cent wettable D.D.T. preparation per 100 gallons (454 litres) of water gave similar control, using some 90 gallons of spray per acre (1,000 litres per hect.). It was also found that D.N.O.C. sprayed as a weed-killer gave equally good control of *Syringopais*.