

Among the plants investigated, those belonging to the genus *Citrus* (*Citrus decumana*, *Citrus acida*, *Citrus medica* and *Citrus aurantium*) and family Rutaceae contained high concentrations of free proline in their leaves, compared to other amino-acids present. Although proline is distributed widely in plant tissues, the occurrence of free hydroxyproline in high concentrations has not been reported so far. However, Joslyn and Stepka³ found traces of free hydroxyproline in prune extract. Dent *et al.*⁴ could not detect this amino-acid in potato tubers although twenty-one other amino-acids were identified. However, the circular paper chromatograms of fresh sandal leaf extracts (*Santalum album*) showed the presence of hydroxyproline, proline, arginine, glutamic acid, alanine and traces of other unidentified amino-acids. The dried sandal leaf extract contained, in addition, leucine (or isoleucine), phenyl alanine, valine and tryptophane. But the most prominent and intensely coloured (yellow) band was that of hydroxyproline. Proline and hydroxyproline were identified by their position and the characteristic yellow colour of their bands on the chromatogram, and further confirmed by the specific test with isatin⁵.

Sandal leaves collected in the morning and dried at 50° C. and powdered showed there was no deterioration in the hydroxyproline content after drying. 50 mgm. of powder were extracted four times with 5-ml. aliquots of 75 per cent alcohol. The combined extract was treated with chloroform as before and the aqueous layer used for the estimation of hydroxyproline by the method of Neuman and Logan⁶ involving oxidation with alkaline hydrogen peroxide and copper sulphate, followed by acidification and reaction with *p*-dimethyl amino-benzaldehyde. The dried healthy leaves contained about 1.7 gm., and a sample of spiked leaves contained 3.0 gm., of hydroxyproline in 100 gm. of material. The predominance of hydroxyproline over other amino-acids present in the leaves of *Santalum album* is striking. So far as we are aware, this is the first record of the occurrence of free hydroxyproline in high concentrations in leaves.

The practical application of these results in the preparation of proline and hydroxyproline from leaves at least on a laboratory scale is an inviting possibility. Investigations in this regard and on the role of the two amino-acids, especially of hydroxyproline in the nitrogen metabolism of spiked and healthy sandalwood trees, are in progress. This has added significance in view of the recent finding of Steinberg⁷ that hydroxyproline was toxic to tobacco seedlings even at 5 p.p.m., indicating a specificity of action.

K. V. GIRI
K. S. GOPALKRISHNAN
A. N. RADHAKRISHNAN
C. S. VAIDYANATHAN

Department of Biochemistry,
Indian Institute of Science,
Bangalore 3, India.

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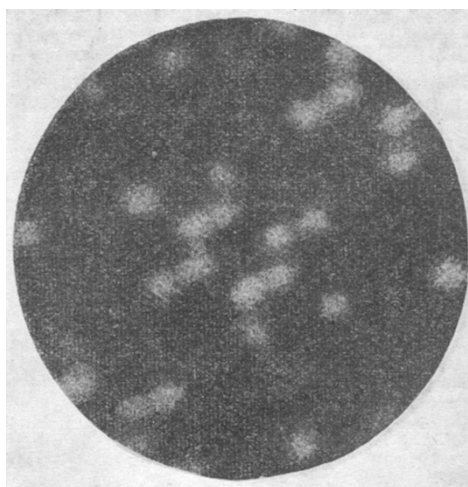
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⁷ Steinberg, R. A., *Bull. Torrey Bot. Club*, **78** (1951).

Improvements in Optical Fourier Synthesis

A METHOD has recently been described of producing Fourier syntheses of centro-symmetrical projections by means of optical interference¹. The biaxial nature of mica was used to introduce into the diffracting beams both intensity and phase relations corresponding to those of the X-ray spectra. The resolution obtained was poor, and it was suggested that this could be improved by using lenses corrected for spherical aberration.

Corrected doublets have now been fitted to the existing apparatus, and considerably better resolution has been obtained. The accompanying photograph is of the optical Fourier synthesis of hexamethylbenzene, based on the X-ray data of Brockway and Robertson². This is a striking improvement over previous work.



Optical Fourier synthesis of hexamethylbenzene

In a recent article³ it was suggested that, unless the available beam of parallel light were greatly extended, this method of optical Fourier synthesis would probably be of very limited application. Work now in progress will make it possible to pack more terms into the available beam; it is hoped that in this way it will be possible to accommodate a maximum index of 15 in each direction. This should greatly increase the scope and usefulness of the method.

A full account of recent developments will be published elsewhere.

A. W. HANSON
Physics Department, College of Technology,
Manchester 1. July 3.

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Lattice Vacancies and Porosity in Copper-Nickel Alloys

IN work on the aluminium-zinc¹ and gold-nickel alloy systems², it has been shown that lattice vacancies occur in solid solutions when Brillouin zones are filled. Similar experiments have been made on copper-nickel alloys, and it is found that lattice vacancies occur in these alloys particularly when they