

of the alkaloid colchicine present in these tubers, the isolation of which had been reported by Clewer, Green and Tutin³ in 1915.

Some months ago, tubers of *G. superba* collected from the Deccan and coastal areas of Bombay State were supplied to the National Chemical Laboratory, Poona, for extracting colchicine which was required for cytogenetic and plant-breeding work in this laboratory. During the extraction, Subbaratnam⁴ reported the isolation of a new alkaloid allied to colchicine which has provisionally been named 'gloriosine'. Very small quantities of the alkaloids colchicine and gloriosine extracted from *G. superba* were made available for testing their influence in inducing polyploidy. A comparison was therefore made by testing these with colchicine obtained from *Colchicum autumnale*. 0.3 per cent aqueous solutions of the three alkaloids were prepared, and plumules of germinated seedlings of two pure varieties of sann hemp (*Crotalaria juncea*) were kept immersed in the solutions for four hours and were later washed and planted out. When the plants were in flower their ploidy was determined.

Swelling and retarded growth of seedlings treated with colchicine from *C. autumnale* and gloriosine showed that polyploidy had been induced. The percentage of polyploids obtained from each of the alkaloids is given in the accompanying table.

Source of alkaloid	No. of seedlings treated	Polyploids	
		Tetraploid	Octoploid
Colchicine from <i>C. autumnale</i>	15	8	—
Colchicine from <i>G. superba</i>	15	5	1*
Gloriosine from <i>G. superba</i>	15	11	—

* The ploidy of some plants in this lot has yet to be determined.

The results of the test clearly indicate that both colchicine and gloriosine from *G. superba* have a polyploidizing effect, and that gloriosine promises to be even more effective than colchicine in inducing polyploidy. Further tests on gloriosine are in progress.

L. S. S. KUMAR

Cytological Laboratory,
College of Agriculture,
Poona 5.
Nov. 15.

¹ Blakeslee, A. F., *J. Hered.*, **28**, 393 (1937).

² Parthasarathy, N., *Curr. Sci.*, **10**, 446 (1941).

³ Clewer, H. W. B., Green, S. J., and Tutin, F., *J. Chem. Soc.*, **107**, 835 (1915).

⁴ Subbaratnam, A. V., *J. Sci. and Indust. Res.*, **11**, 446 (1952).

Identification of 4-Methyl-D-glucuronic Acid in *Eucalyptus regnans* Wood

MANY workers have identified the hexuronic acid components of pectins, gums and mucilages¹. However, the uronic acid components of wood hemicelluloses have proved difficult to identify. O'Dwyer² and Yaramori and Tachi³ have shown that glucuronic acid is present in the hemicelluloses of beech wood and of elm wood respectively. O'Dwyer^{4,5} has obtained, from oak wood, an aldobiuronic acid containing one methoxyl group per uronic acid residue. Also, Sands and Gary⁶ have obtained an aldobiuronic acid from mesquite wood hemicellulose: they

demonstrated that the aldobiuronic acid contained a methoxyl group and, because of the difficulty encountered in the identification of the uronic acid (viewed in the light of the experience of Anderson and Otis⁷), suggested that the methoxyl group was attached directly to the uronic acid residue.

White⁸ and Smith⁹ have shown, by different methods, that the acid hydrolysate from mesquite gum (an exudate from mesquite wood) contains 4-methyl-D-glucuronic acid residues.

It has now been demonstrated that the acid hydrolysate from *Eucalyptus regnans* F. v. M. wood also contains 4-methyl-D-glucuronic acid residues. *E. regnans* shavings were hydrolysed with *N* sulphuric acid and the hydrolysate was neutralized with barium carbonate, filtered and concentrated. The barium salts (consisting chiefly of barium aldobiuronate) were isolated by repeated precipitation from aqueous ethanol, and the crude product (Ba, 16 per cent; uronic acid anhydride, 38 per cent; OCH₃, 6 per cent) was refluxed for 20 hr. with 8 per cent methanolic hydrogen chloride. The resulting crude methyl glucuronoside syrup (b.p. 132°–136° (bath temp. 185°)/0.1 mm., n_D^{20} 1.48, $[\alpha]_D^{20}$ + 88° in methanol (c, 2.8), 29.2 per cent OCH₃) was then treated according to Smith⁹ to give the amides of 4-methyl methyl- α - and - β -D-glucuronosides. (α -form, m.p. 232°, $[\alpha]_D^{20}$ + 152° in water (c, 0.36); β -form, m.p. 228°, $[\alpha]_D^{20}$ - 62° in water (c, 0.25).) The mixed α - and β -forms, on analysis, gave: C, 43.37; H, 6.75; O, 42.8; N, 6.51; OCH₃, 27.46 per cent; C₈H₁₅O₆N requires C, 43.46; H, 6.84; O, 43.40; N, 6.33; OCH₃, 28.06 per cent. Both forms of the amide gave X-ray powder diffraction diagrams the lines of which were identical with those of samples obtained through the courtesy of Dr. F. Smith.

In addition, it was shown that D-xylose (characterized as its dibenzylidene dimethyl acetal, m.p. 211° not depressed on admixture with a sample prepared from authentic D-xylose) was also present in the mother liquors resulting from the crystallization of the mixed amides and, further, that the crude barium aldobiuronate contained no glucosidic methoxyl groups. Hence it is probable that the non-resistant carbohydrate fraction of *E. regnans* wood contains residues of the aldobiuronic acid, 4-(4-methyl-D-glucuronosyl)-D-xylose.

Since this work was completed, our attention has been directed to a paper by Jones and Wise¹⁰, who have shown that the acid hydrolysate from aspen wood contains 4-methyl-D-glucuronic acid.

C. M. STEWART
D. H. FOSTER

Wood Chemistry Section,
Division of Forest Products,
Commonwealth Scientific and
Industrial Research Organization,
Melbourne.
Oct. 24.

¹ Hirst, E. L., *J. Chem. Soc.*, **70** (1942).

² O'Dwyer, M. H., *Biochem. J.*, **20**, 656 (1926).

³ Yaramori, N., and Tachi, I., *Mem. Coll. Agric., Kyoto Univ.*, **57** (Chem. Series, **24**), 12 (1950).

⁴ O'Dwyer, M. H., *Biochem. J.*, **28**, 2116 (1934).

⁵ O'Dwyer, M. H., *Biochem. J.*, **33**, 713 (1939).

⁶ Sands, L., and Gary, W. Y., *J. Biol. Chem.*, **101**, 573 (1933).

⁷ Anderson, E., and Otis, L., *J. Amer. Chem. Soc.*, **52**, 4461 (1930).

⁸ White, E. V., *J. Amer. Chem. Soc.*, **70**, 367 (1948).

⁹ Smith, F., *J. Chem. Soc.*, 2646 (1951).

¹⁰ Jones, J. K. N., and Wise, L. E., *J. Chem. Soc.*, 2750 (1952).