



and (ii) by the action of ethyl bromoacetate upon ethyl butanetetra-carboxylate. The hexa ester (II) on being boiled with hydrochloric acid (1:1) during 18 hours gets hydrolysed and decarboxylated to give rise to $\beta\beta'$ -dicarboxy-suberic acid (III). (Found: C, 45.04; H, 4.52; Equiv., 66.34; Calc., C, 45.78; H, 5.38 per cent.; Equiv., 65.5). The acid (III) melts at 177–78° when it is first crystallised from acetic acid and then from water. The acid (III) obtained from (I) on being crystallised from acetic acid and then from water also melts at 177–78°; the mixed melting point with the synthetic variety (m.p. 177–78°) remaining undepressed. The ethyl ester of the acid (III) boils at 195–205°/2 mm. (Found: C, 57.91; Calc., C, 57.75 per cent.).

With a view to effecting a double Dieckmann condensation with the tetra ester, it has been subjected to the action of molecular sodium under varying experimental conditions, the results of which will shortly be published elsewhere.

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¹ Guha, *Curr. Sci.*, 1936, 5, 19.

The Colouring Matter of Deccan Hemp (*Hibiscus cannabinus*) Flowers— Cannabiscitrin and Cannabiscetin.

FROM the pale yellow flower petals a yellow crystalline glucoside having the formula $\text{C}_{21}\text{H}_{20}\text{O}_{13}$ has been obtained. It yields a colourless non-acetyl derivative on acetylation. On hydrolysis with dilute mineral acids, it produces a molecule of glucose and a flavonol having the composition $\text{C}_{15}\text{H}_{10}\text{O}_8$. The flavonol which occurs free also to some

extent forms a hexa-acetate and a hexa-methylether and displays bright colours in dilute alkaline solutions in the presence of air. It is a penta-hydroxy flavonol which is not identical with gossypetin, quercetagetin or myricetin, but is isomeric. This new member of the flavonol series is named Cannabiscetin and the glucoside therefore becomes Cannabiscitrin. From the flowers of *Hibiscus sabdariffa*, Perkin¹ isolated besides gossypetin a pigment of unknown constitution which he named Hibiscetin. Hence the new names given by us indicate origin from *Cannabinus*.

Cannabiscetin resembles gossypetin in giving the gossypetone reaction though not so readily and probably therefore contains two hydroxyl groups in the positions 5 and 8. Further work is in progress.

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¹ A. G. Perkin, *J.C.S.*, 1909, 1855.

Influence of Added Chemicals on the Destructive Distillation of Coconut Shells.

SUDBOROUGH, Watson and co-workers^{1, 2} in an exhaustive study of distillation of different species of wood and wood wastes, found among the latter class, that coconut shells yielded the highest percentage of acetic acid in the pyroligneous liquor. They also found that the yield of the settled tar from the same source was sufficiently great to warrant a closer study with a view to obtain creosote therefrom. The distillation of the coconut shells has been carried out by A. H. Wells,³ Georgi and Buckley⁴ and by Kidavu and Nambiyar.⁵

It appears that Hawley⁶ was the first to study the influence of added salts on the course of distillation and on the yield of products in wood, but several other workers have carried out similar studies elsewhere. The present study was undertaken with a view to follow the course of reaction as well as of the alteration in the yield of products, due to the impregnation of shells with various salts, and then subjecting them to destructive distillation. A study was also made of the variation in the yields from the shells of different localities.

Shells from Bangalore and Trivandrum

Table showing the yield of products from treated and untreated shells and from different localities.

Products	Shells (untreated) from Bangalore percentage	Shells (untreated) from Trivandrum percentage	Shells (treated) from Trivandrum	
			Zinc salt	Aluminium salt
Charcoal ..	37.2	35.1	35.5	37.5
Pyroligneous liquor ..	39.4	41.0	43.5	38.3
Settled Tar ..	5.4	7.2	5.0	7.7
Gas (by difference) ..	18.0	16.7	16.0	16.5
Acetic acid in pyroligneous liquor ..	14.0	7.3	8.0	6.8

were first crushed in a jaw crusher, and graded. This material was well mixed with solutions containing various percentages of salts, and evaporated and dried over a water-bath to its original weight. The material thus treated was distilled in one kilo lots in an electrically heated retort.

The temperature of the retort was gradually raised by passing the current intermittently, the maximum temperature recorded being 320° C. The total time for distillation was little over three hours, the time during which the current was passed being only about an hour and a quarter. Distillation starts after half an hour's heating, when a colourless distillate collects in the receiver. The rate of distillation increases gradually reaching the maximum, soon after the retort attains a temperature 280° C., when the current can be completely cut off for over half an hour. At this stage the evolution of gaseous products reaches the maximum; and the nature of the flame indicates the absence of unsaturated hydrocarbons, which however appear towards the end of the distillation.

The rate of distillation is hastened by salts like sodium carbonate and magnesium chloride, even at a lower temperature, while a salt like sodium phosphate has no such effect. Zinc and magnesium salts give an increased yield of pyroligneous liquor and reduce the yield of tar while aluminium salts reduce the yield of pyroligneous liquor but slightly increase the yield of settled tar.

Shells from different localities gave different yields of tar, and acetic acid in the pyroligneous liquor as shown in the following table.

Further work with the different products and their economic utilization according to the present needs of the country is in progress.

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¹ "Wood Distillation," *J. Ind. Inst. Sci.*, 1918, 2, VII, 285-89.

² — *ibid.*, 1920, 3, IX, 293-306.

³ *Philippine J. of Sci.*, 1917, 12, (A), p. 111.

⁴ *Malay Agric. Jour.*, 1929, 17, 398-402.

⁵ *Madras Agric. Dept. Year-Book*, 1927, 33-35.

⁶ *J. Ind. Eng. Chem.*, 1922, 16, 43-44.