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The Flavour of Rum

Recent Chromatographic Research.

By RAFAEL ARROYO, Ch.E. & S.E., F.A.A.A.S.[1]

Rum has always been defined as an alcoholic beverage obtained by the distillation of fermented mash produced by the alcoholic fermentation of sugar cane juice, sugar cane final molasses, and/or any of the intermediate materials produced in the process of cane sugar manufacture, such as clarified cane juice, syrup, and first and second molasses. However, the greater part of commercial rums are produced from final sugar cane molasses, so-called blackstrap molasses.

Rum importing countries where the sugar cane plant will not thrive, but where the sugar beet grows well and produces abundant crops, have tried to manufacture rums from beet molasses without success. In the attempts to produce these rums it was found that the products obtained possessed practically the same analysis as veritable rums obtained from blackstrap, and yet they always lacked the specific rum aroma and taste characteristic of cane molasses rums. It was also found that the quality of these rums could be greatly improved if cane molasses was mixed with the beet molasses used for the fermentation process. While these facts were recognized both by research workers and industrialists who attempted the production of beet molasses rums, they were baffled in finding an explanation of the results. So the matter stood as an unsolved problem for many years.

Recent developments in sugar research have thrown some new light on this problem, although the particular research that contributed to the added knowledge had nothing to do with the production of rum from either cane or beet molasses. We refer to the work of W. W. Binkley and M. L. Wolfrom on recovery of sucrose from cane blackstrap and beet molasses, published as a contribution from the Chemical Laboratory of the Ohio State University.[2] In this research, chromatographic procedures were applied to the recovery of sucrose from cane and beet molasses with great experimental success. In each case the nature of the effluent was investigated by the collection of several fractions, nine in the case of the cane molasses, and eleven in the case of the beet molasses. During the examination of the different fractions obtained from the cane molasses, it was found that fractions 2, 3 and 4 had strong, pleasant, rum-like odours; while the corresponding fractions in the case of the beet molasses were entirely devoid of this characteristic scent, showing only the strong unpleasant odour of beet molasses.

And this is the point that bears interest and adds new light on the failures experienced by investigators and industrialists in their attempts to produce genuine rums from the fermentation and distillation of beet molasses even when apparently they could produce distillates of chemical constitutions comparable to, and in some cases identical with, those of veritable rums obtained from cane molasses.

The aromatic constituents found in cane molasses, but absent in beet molasses, no doubt play an important role in the formation of rum taste and aroma, and evidently determine the difference found in the respective distillates produced in each case. These aromatic constituents, whose true chemical constitutions and natures remain unknown up to the present time, must, of course, pass into the rum obtained during the process of distillation. Whether they pass into the distillate as they exist in the cane blackstrap, or become modified or transformed into other related aromatics during the processes of fermentation and distillation, is another very important question that remains unsolved.

The light thrown on this subject by the work above referred to will undoubtedly widen and increase its scope when yet further results become available in the literature. We believe that, great as may be the importance of this research in the field of sugar production and sugar recovery, its bearing on the problems of rum composition and production may prove to be of even greater scientific and industrial interest.

Cane Borer Control, using Camphene.—Tests on borer control using cryolite have already been reported.[3] In a series of recent experiments, A. L. Dugas and others of the Louisiana Experiment Station[4] found that against first generation cane borers large-scale applications of cryolite still proved slightly superior to chlorinated camphene. In tests for control of second generation borers, benzene hexachloride, chlorinated camphene, parathion and chlordane gave either very little control or were actually responsible for significant increases in borer infestations and losses in yields of cane and sugar.

CADE Weed Killer.—F. E. Hance reports[5] that CADE (homogenized 67 per cent. diesel oil in 33 per cent. aqueous emulsion) together with H.S.P.A. activator (pentachlorophenol or sodium pentachlorophenate) at the rate of 7½ lb. per gal. and a suitable wetting agent (as a sulphonated aromatic compound) at the rate of 3 lb. per gal. was found to be at least equal to 'Concentrate 40', an activated arsenical containing 10 lb. of As_2O_3 per 100 gal. Treatment with it in the cane lines while producing a slight 'burn' to succulent growth did not appreciably injure the crop, as recovery took place within two wee ks after application.

1 Consulting Chemist and Fermentologist, Box 136, Rio Piedras, Puerto Rico. 2 *I.S.J.*, 1947, p. 298. 3 *I.S.J.*, 1947, p. 176. 4 *Sugar J.* (La.), 1948, **10**, No. 11, p. 8. 5 *Rpts. 67th Meeting of the Hawaiian Sugar Planters' Association*, pp. 64-78.

LIST OF MORE IMPORTANT BUILDINGS AND STRUCTURES.

1—Enclosure for meteorological instruments. 2—Chemical laboratories. 3—Lorry shed. 4—Mill room. 5—Chemical store room. 6—Garage. 7—Bachelor staff quarters. 8—Garage. 9—Main building—administrative offices, library, botanical and entomological laboratories. 10—Glasshouse for plant pathological work. 11—Workshop and storeroom for botanical department. 12—Insectary. 13—House of Mr. P. G. C. Brett, Plant Breeder. 14—Lawn tennis court. 15—Director's house (Dr. H. H. Dodds). 16—House of Senior Agricultural Officer (Mr. W. L. Fielding). 17—House of Dr. J. Dick, Entomologist. 18—House of Dr. A. McMartin, Botanist. 19—House of Mr. C. D. Sherrard, Agricultural Officer. 20—House of Mr. H. G. Munro, Carpenter & Builder. 21—Water tower. 22—House of Mr. C. Booth, Agricultural Officer. 23—House of Mr. F. L. Almond, Agricultural Officer. 24—House of Mr. J. L. du Toit, Chemist. 25—House of Mr. N. C. King, Plant Pathologist.

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