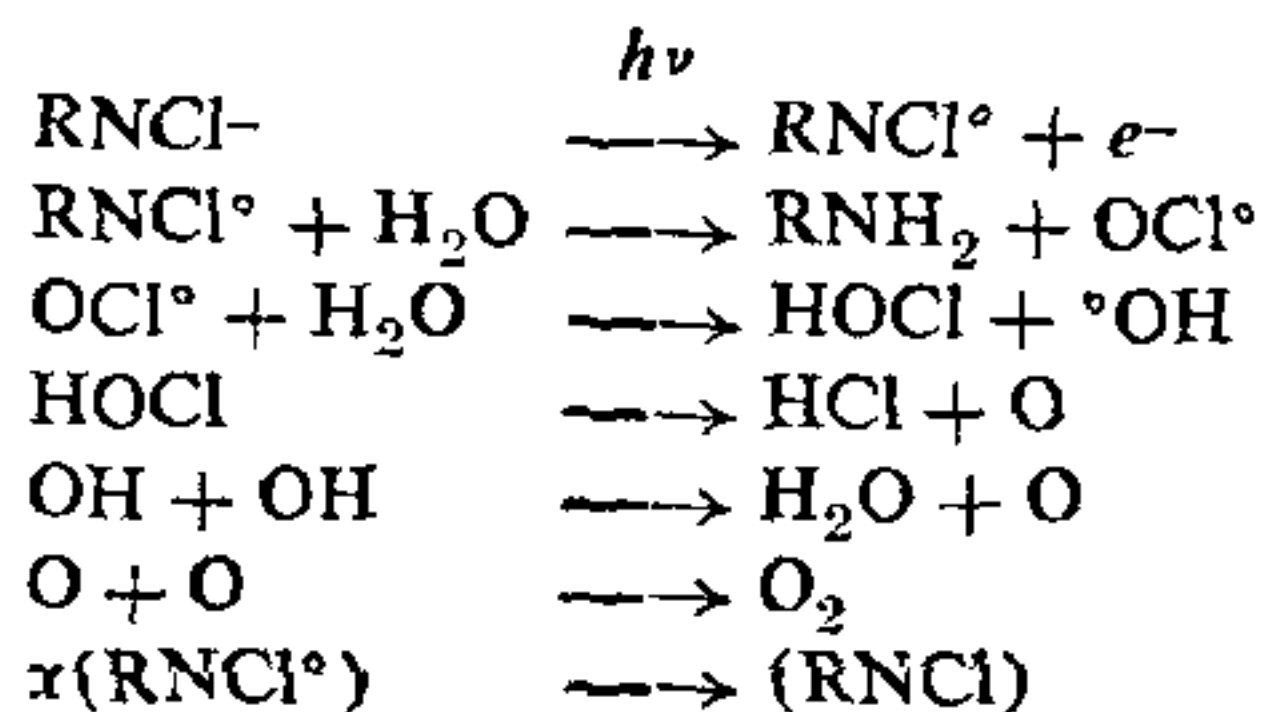


only an yellow coloration but when the solution was irradiated for longer periods (4-6 hours) a pale yellow precipitate was obtained. This was filtered, washed with water. When the product was extracted with alcohol or benzene an insoluble residue was left behind, but the product was completely soluble in pyridine and tetrahydrofuran. Attempts to check the homogeneity of the precipitate by TLC and paper chromatographic techniques with benzyl alcohol saturated with water as the solvent showed that the product consisted of at least two fractions. The pyridine solution was found to be unstable giving 4-5 fractions. These results agree with those of Dietzel and Taufel¹² who photolysed aqueous CAT solutions with polychromatic radiation and obtained a complex mixture containing acidic and basic products. In the present work, it is likely that the photolysis of CAT could lead to the decomposition of HOCl and formation of resinous products (RNCl)_x as follows:



However, a complete analysis of the photolytic product (or products) would become necessary for proposing a detailed mechanism for the photochemical decomposition of aqueous CAT solutions.

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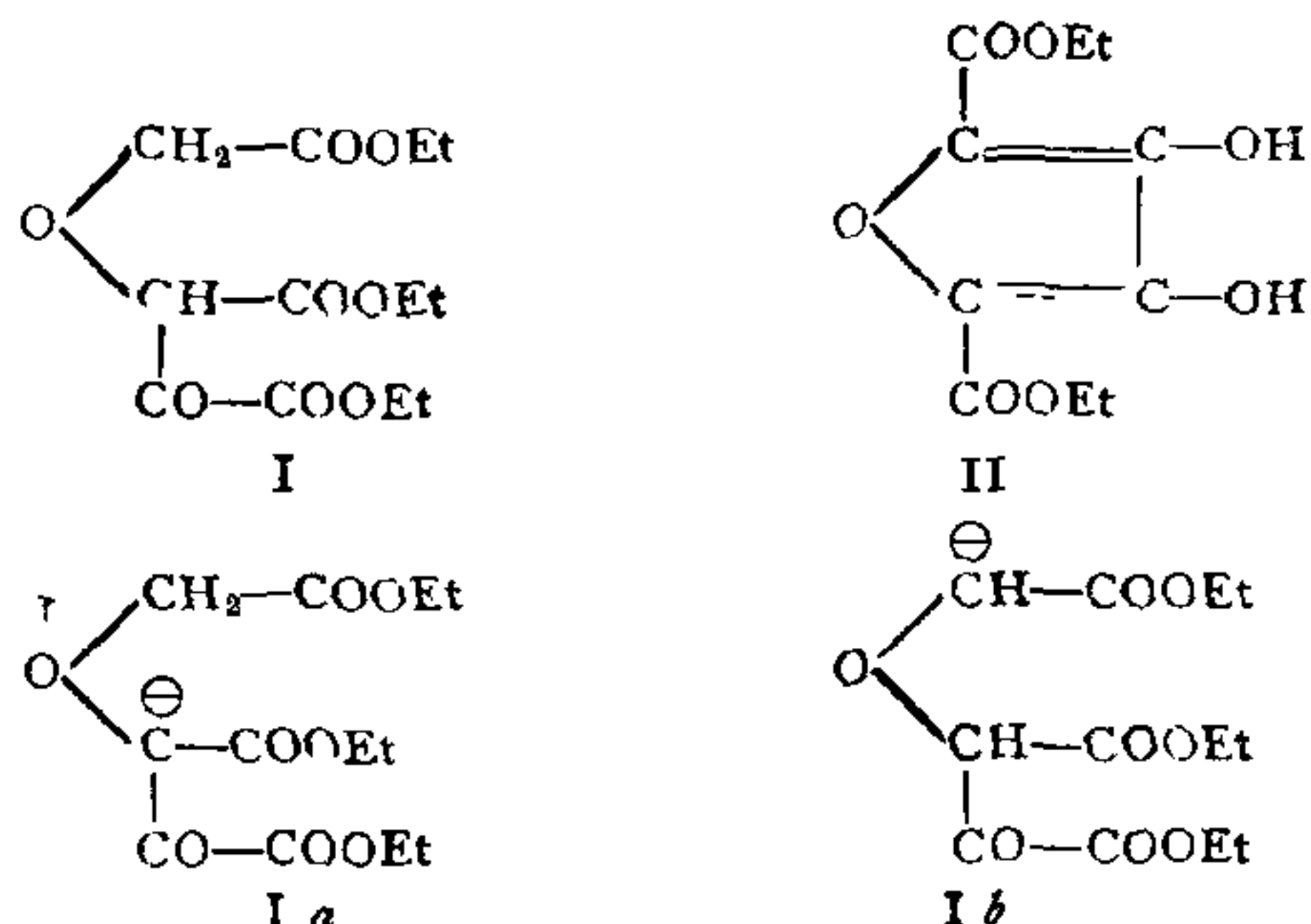
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MECHANISM OF THE DIECKMANN-KOMPPA REACTION OF DIETHYL OXALATE WITH DIETHYL OXYDIACETATE

THE Dieckmann-Komppa reaction of diethyl oxalate and diethyl oxydiacetate to yield 2,5-dicarbethoxy-3,4-dihydroxyfuran (II) has been effected earlier¹⁻³; but a plausible intermediate, formed by the initial Claisen condensation of the esters, had not been isolated.

This intermediate, triethyl α -oxalyloxydiacetate (I), is formed in about 60% yield when diethyl oxalate and diethyl oxydiacetate are condensed in molar quantity of ethanol-free sodium ethoxide in ether at 0°; a 15% yield of the furan derivative (II) is also obtained.

It was observed that the oxalyl intermediate (I) gave extremely low yields of the furan (II) when its cyclisation was tried with sodium in refluxing benzene, or ethanol-free sodium ethoxide in ether. However, when the experimental conditions were altered to refluxing ethanolic sodium ethoxide, excellent yields of the furan (II) were obtained.



Similarly, in the Dieckmann-Komppa reaction of diethyl oxalate and diethyl oxydiacetate, it was observed that the best yields were obtained when the reaction was conducted in the presence of molar quantity of ethanolic sodium ethoxide. Even with excess of refluxing ethanolic sodium ethoxide, the furan (II) was recovered quantitatively, indicating no reversal of the reaction.

It is suggested⁴ that in the presence of a low concentration of ethoxide ions as with ethanol-free sodium ethoxide or sodium dust, the carbanion Ia is formed by abstraction of the most acidic hydrogen atom and the reaction does not proceed further as the insoluble sodium salt separates. Whereas, with ethanolic sodium ethoxide, in the presence of large concentration of ethoxide ions, the carbanion Ib is also formed which under equilibrating reaction conditions leads to the furan derivative (II).

Experimental

Triethyl α-oxalyloxydiacetate (I).—To ethanol-free sodium ethoxide, from 1.2 g sodium, in ether (50 ml), diethyl oxalate (7.3 g) was added and the resultant yellow solution cooled in ice. A solution of diethyl oxydiacetate (9.5 g) in ether (25 ml) was carefully added to the above solution and the reaction mixture kept at 0° for 72 hr. On working up⁴ (the oxalyl derivative was soluble in water and hence the aqueous phases had to be saturated with sodium chloride and repeatedly extracted with ether), triethyl α-oxalyloxydiacetate (I) (8.2 g, 57%) and 2, 5-dicarbethoxy 3, 4-dihydroxyfuran (II) (1.8 g, 15%), m.p. 188°, were obtained. The oily oxalyl derivative (I) gave intense violet colour with ferric chloride solution and on pyrolysis, it evolved carbon monoxide. It was used for cyclisation without further purification as it decomposed on vacuum distillation.

Cyclisation of Triethyl α-oxalyloxydiacetate (I).—To refluxing sodium ethoxide, from 0.92 g sodium in ethanol (50 ml), was added dropwise a solution of triethyl α-oxalyloxydiacetate (I) (5.8 g) in ethanol (25 ml) over 5 min. and the reaction mixture refluxed for 5 hr. Excess of ethanol was removed by distillation under vacuum and the reaction mixture, on working up, yielded 2, 5-dicarbethoxy-3, 4-dihydroxyfuran (II) (3.3 g, 68%), m.p. 181–4°. On recrystallisation from ethanol, it melted at 188°; lit.², m.p. 189°.

With sodium dust in refluxing benzene, under identical conditions, the yield of furan (II) was only 10%.

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VARIETAL DIFFERENCE ON THE NUTRIENT COMPOSITION OF BANANA POWDERS

THE edible portion of banana fruit includes water, carbohydrates, fats, proteins, organic acids, mineral matters and other volatile constituents. The proportion in which these constituents occur vary greatly in different varieties of bananas. The present study reports the nutrient composition of Basrai, Harichal, Lalkel (variety of *Musa cavendishii*), Rajeli, Safed Velchi (variety of *Musa paradisiaca*) banana powders.

Basrai banana was obtained from Jalgaon District, Maharashtra State, while other varieties of bananas were obtained from Bassein Road, Bombay. In order to get banana bunches of uniform maturity, nearly 100 banana plants were tagged at the time of inflorescence emergence in a nearby banana plantation where uniform cultural practices were maintained throughout the growing season. From the above lots two bunches each of uniform development were harvested at 100 days of growth (full round shape) after the inflorescence emergence. These bunches were immediately brought to the laboratory, separated into hands and stored in an incubator at a temperature of 18–20° C.

Banana powder was prepared in the following way:

Raw bananas of the above five varieties were allowed to ripen in the laboratory, in an incubator at a temperature of 18–20° C and a relative humidity of 68–75%. The ripening was allowed to proceed to a stage when the fruit became very soft. The fruits were peeled and pulp was then cut into small pieces with the help of stainless steel knife. The macerated pulp was then dried at 60° C under 58 cm of vacuum. After nine hours, the dried product was pulverised and passed through 50 mesh sieve and the powder was stored in air tight polyethylene bags in air tight container. These banana powders were analysed for proximate principles, minerals and vitamins.

Proximate principles and calcium were estimated by A.O.A.C., method¹. Total titratable acidity was determined according to the method suggested by Miller². Pectin as calcium-pectate was determined by the method of Carre-Haynes³ as modified by Joslyn⁴. Total sugar percentage was calcu-