ON THE PRESENCE OF AN OXIDISING-ENZYME IN THE LATEX OF *HEVEA BRASILIENSIS*

By D. SPENCE, PH.D., A.I.C.

From the Bio-Chemical Laboratory, University of Liverpool

(Received July 1st, 1908)

The following note is intended rather as an addition to a recent paper published in this Journal on the presence of oxydases in india-rubber than as an independent communication on this subject. The question of oxidising-enzymes in indiarubber and in the latex secretion from which this is derived has been fully dealt with in my original paper,¹ and will not, therefore, be discussed again here. As this subject appears to me, however, to be an important one, both biologically in regard to the function of the caoutchouc in the latex of the plant, and commercially in view of possible improvements in the preparation of raw rubber, and furthermore as only indirect evidence was available at the time for the presence of an oxydase in the raw Para rubber examined, it may not be out of place to record here that since the previous communication was written I have had the opportunity of examining four separate samples of latex from *Hevea brasiliensis* (Para rubber), and have found in each marked evidence of the presence of an oxidising-enzyme.

The latices investigated were collected on the Jugra Estate, Ceylon,² and were preserved according to my directions by methods which will be described in their proper place. The samples arrived here in good condition, and showed no signs of coagulation macroscopically or microscopically.

For the examination of the latices for oxidising-enzymes the same methods were employed as were described in connection with *Funtumia elastica*.³ The latex was dialysed for twenty-four hours

1. *Bio-Chemical Journal*, Vol. III, No. 4, p. 165, 1908.

2. I should like to take this opportunity of expressing my thanks to Messrs. Edward Lawrence & Co., of Liverpool, for the care which they have taken in collecting, and for their kindness in providing me with this material.

3. *Loc. cit.*, p. 175.

into running water in order to remove products which might interfere with the reactions. The dialysed latex was then tested with the reagent for detecting the presence of oxidising-enzymes, both with and without hydrogen peroxide. Controls in this case consisted of latex which had been made very faintly alkaline and carefully raised to 80° C., and kept at this temperature for five minutes, then cooled and neutralised immediately before use. In this connection it may be well to point out that only the alkaline or neutral reagents are suitable for the direct determination of oxidising-enzymes in the latex, for those reagents which react best in a faintly acid medium or in alcoholic solution (tincture of guaiacum) produce rapid coagulation of the latex, and give uncertain results.

Each of the four samples of Hevea latex examined was found to give a marked positive reaction without hydrogen peroxide, and a still more intense reaction in presence of this chemical when the indophenol mixture of Röhmann and Spitzer, the hydrochinon and the *p*-phenylene-diamine reagents, were employed as indicators.

Furthermore, by diluting the latices with water and then coagulating with 40 per cent. alcohol, it was found possible by addition of absolute alcohol to the watery mother-liquor to separate the oxidase in an impure state in the form of a gummy mass, which, on drying in vacuo, left a small quantity of a brown vitreous solid. This solid when dissolved in water gave all the reactions of a powerful oxydase.

The chemical properties of this oxidising-enzyme in the latex of *Hevea brasiliensis* have not yet been studied, but the present note serves at least to show that in spite of the negative results of Schidrowitz and Kaye¹ the latex of *Hevea brasiliensis* does actually contain an oxydase enzyme, so that the chain of experimental evidence for the existence of such an enzyme in the so-called insoluble constituent of Para rubber is now complete.

1. *India Rubber Journal*, Vol. XXXIV, No. 1, p. 24 (1907).