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Note

A method for detection of non-reducing saccharides

TETSUYA YAMADA, MAKOTO HISAMATSU and MOTOJI TAKI
Faculty of Agriculture, Mie University, Tsu, Mie-ken (Japan)
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Non-reducing saccharides on paper chromatograms can be detected by a combination of sodium periodate solution and other reagents[1–3]. However, the combination of sodium periodate with silver nitrate as a detection reagent has not been reported, and we have found that more compact spots are obtained if the sodium periodate is used in aqueous acetone solution. By using the set of reagents described below in the detection of non-reducing saccharides, alditols, reduced oligosaccharides and various glycosides, we obtained clear and persistent spots in every instance.

EXPERIMENTAL

The detection reagents were as follows.

(1) a 1% solution of sodium metaperiodate in 50% aqueous acetone; this solution can be stored for a few days at room temperature.

(2) a silver nitrate solution prepared by pouring 1 ml of saturated aqueous silver nitrate solution into 100 ml of 95% aqueous acetone.

(3) 1% sodium hydroxide solution.

(4) 5% sodium thiosulphate solution.

Procedure

The dried chromatogram was sprayed with reagent 1, and, after 2 min at room temperature, with reagent 2; non-reducing saccharides appeared as bleached spots on a pale-yellow background. After 5 min, the sheet was sprayed with reagent 3; the spots change to black. The stained paper was then dipped into reagent 4, which bleached the background, and thoroughly washed in tap-water.

RESULTS

Fig. 1 shows the spots obtained with this method, especially when the right- and left-hand sides of the chromatogram are compared. Both sides were treated identically, except that the left-hand side was not sprayed with reagent 1.

By using this new method, glycerol, erythritol, inositol, maltitol, reduced oligosaccharides and methyl α-D-glucoside were detected. Further, saccharides were so deeply stained by the treatment that the method can be recommended for the detection of oligosaccharides.

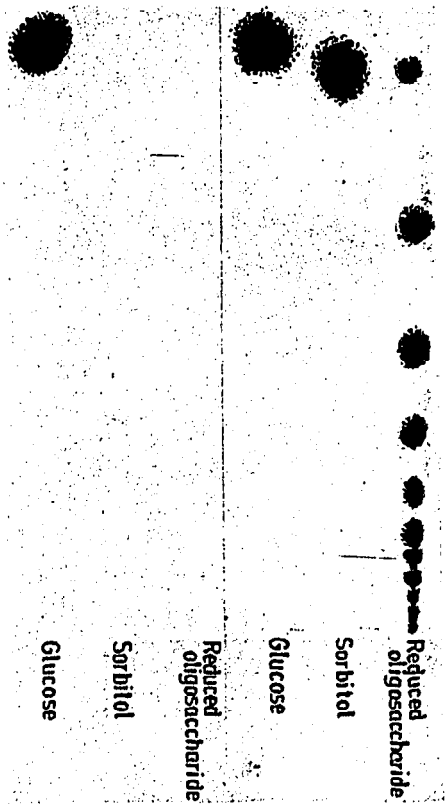

Fig. 1. Paper chromatogram of saccharides after descending development in the solvent system *n*-butanol–pyridine–water (6:4:3, v/v); right-hand side treated with reagents 1, 2, 3 and 4; left-hand side treated with reagents 2, 3 and 4.

The method of Waldi[4] and its modification by Mowery[5] may be satisfactory for thin layers, but gave only very diffuse ill-defined spots on paper chromatograms.

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