

## INTRODUCTION

Psicose or allulose is a rare monosaccharide which has gained much interest as a natural low-caloric sugar (0.4 cal/g). It can be produced from fructose by an isomerization reaction. However, the reaction also gives glucose and mannose as by-products. This study aimed to evaluate the use of commercial cation exchange resin in  $\text{Ca}^{2+}$  form for separation of psicose from glucose, mannose, and fructose. This data will be useful for designing of a purification process for psicose production.

## EXPERIMENTAL

### ◆ Ion-exchange column chromatography

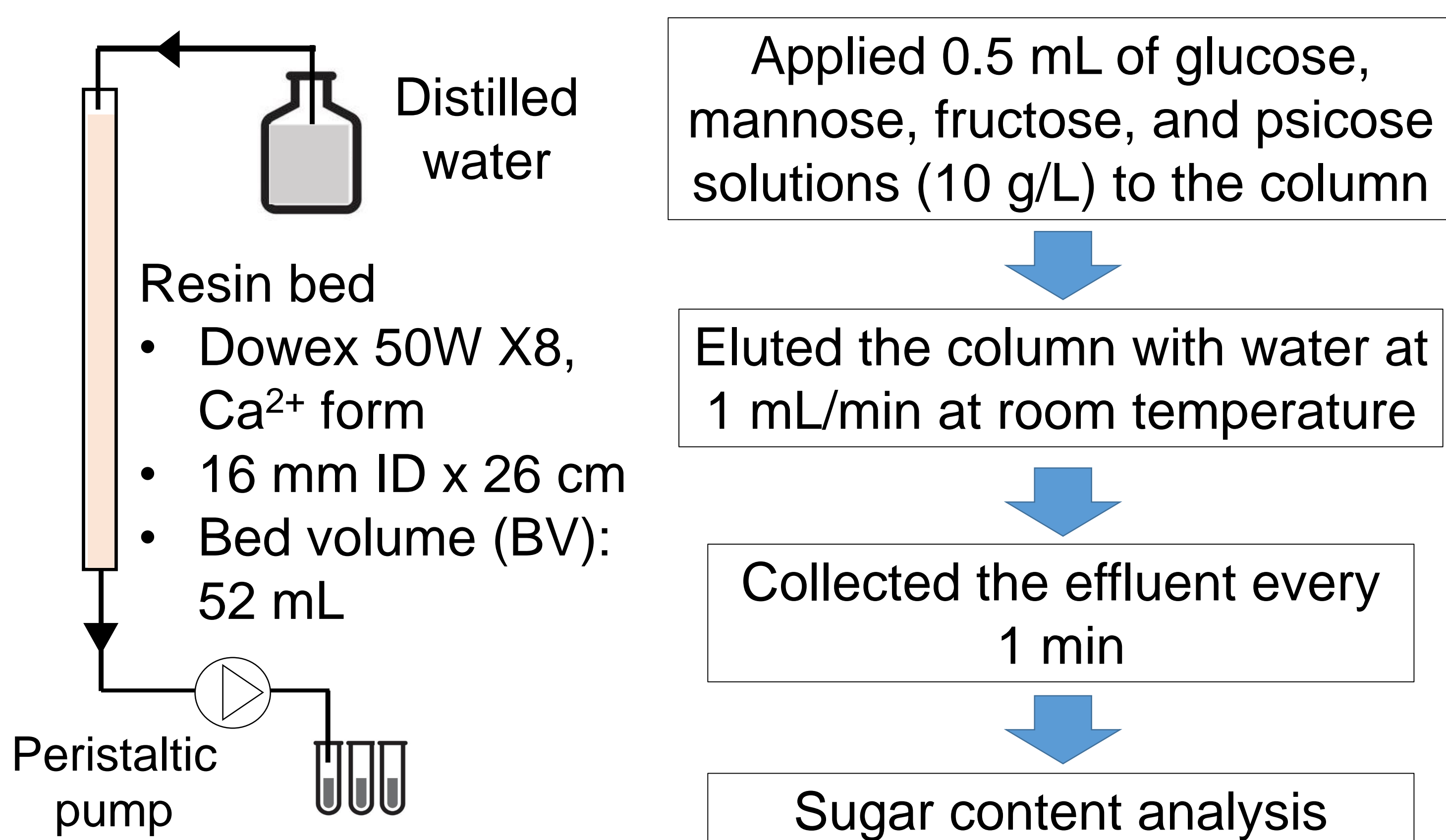


Fig. 1. Ion-exchange column chromatography unit.

### ◆ Dinitrosalicylic acid (DNS) method

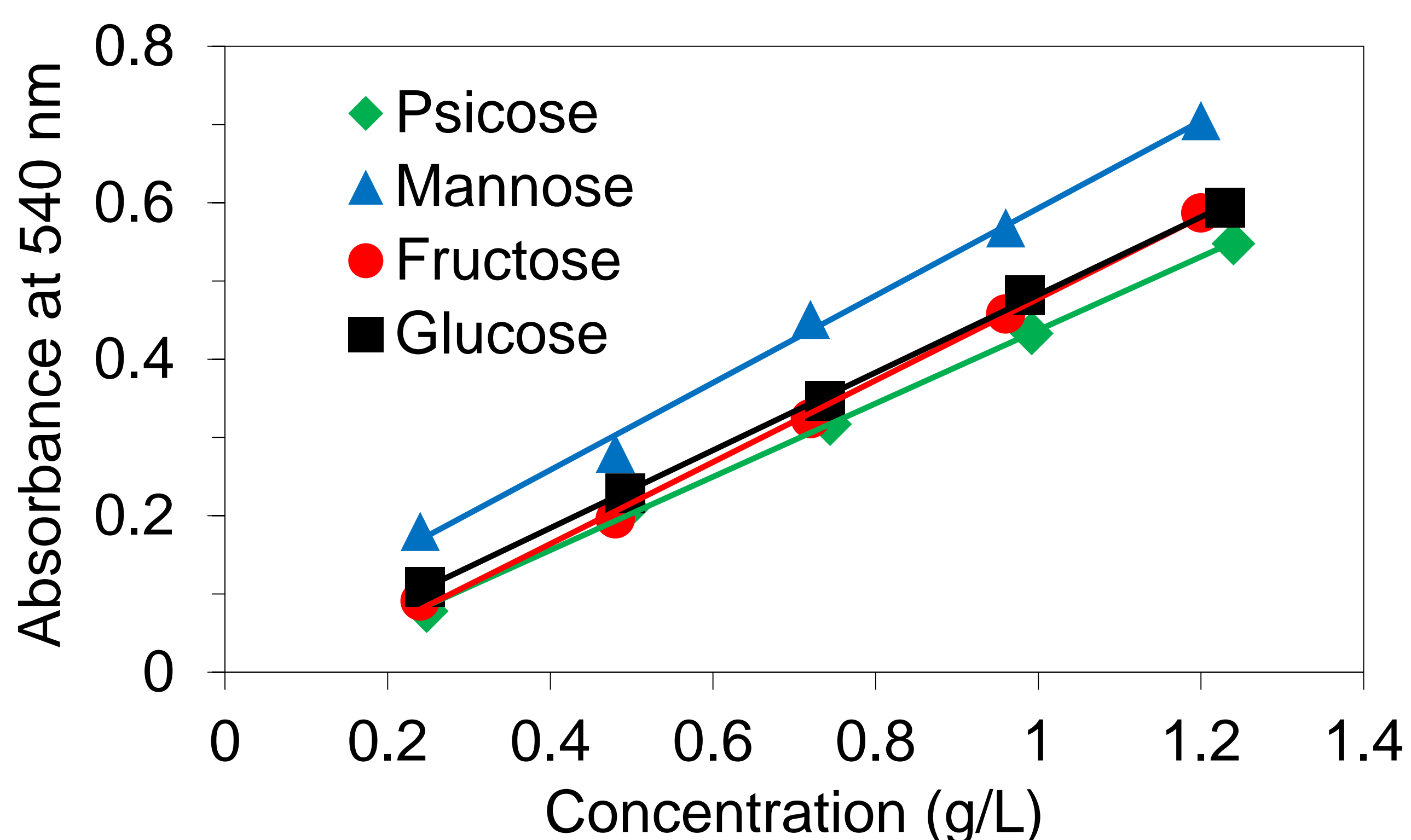


Fig. 2. Standard curve of sugars by DNS method.

### ◆ Resolution ( $R_s$ )

$$R_s = \frac{2[(t_R)_B - (t_R)_A]}{W_B + W_A}$$

where  $t_R$  and  $W$  are the retention time and elution peak width, respectively, for psicose (B) and other sugars (A).

## RESULTS

Figure 3 shows that psicose was eluted slower than the three other sugars on  $\text{Ca}^{2+}$  ion-exchange resin. The resolution values between psicose and other sugars (Fig. 4) were higher than 0.85. These results suggested that it is possible to separate pure psicose from the isomerization mixture containing fructose, mannose, and glucose.

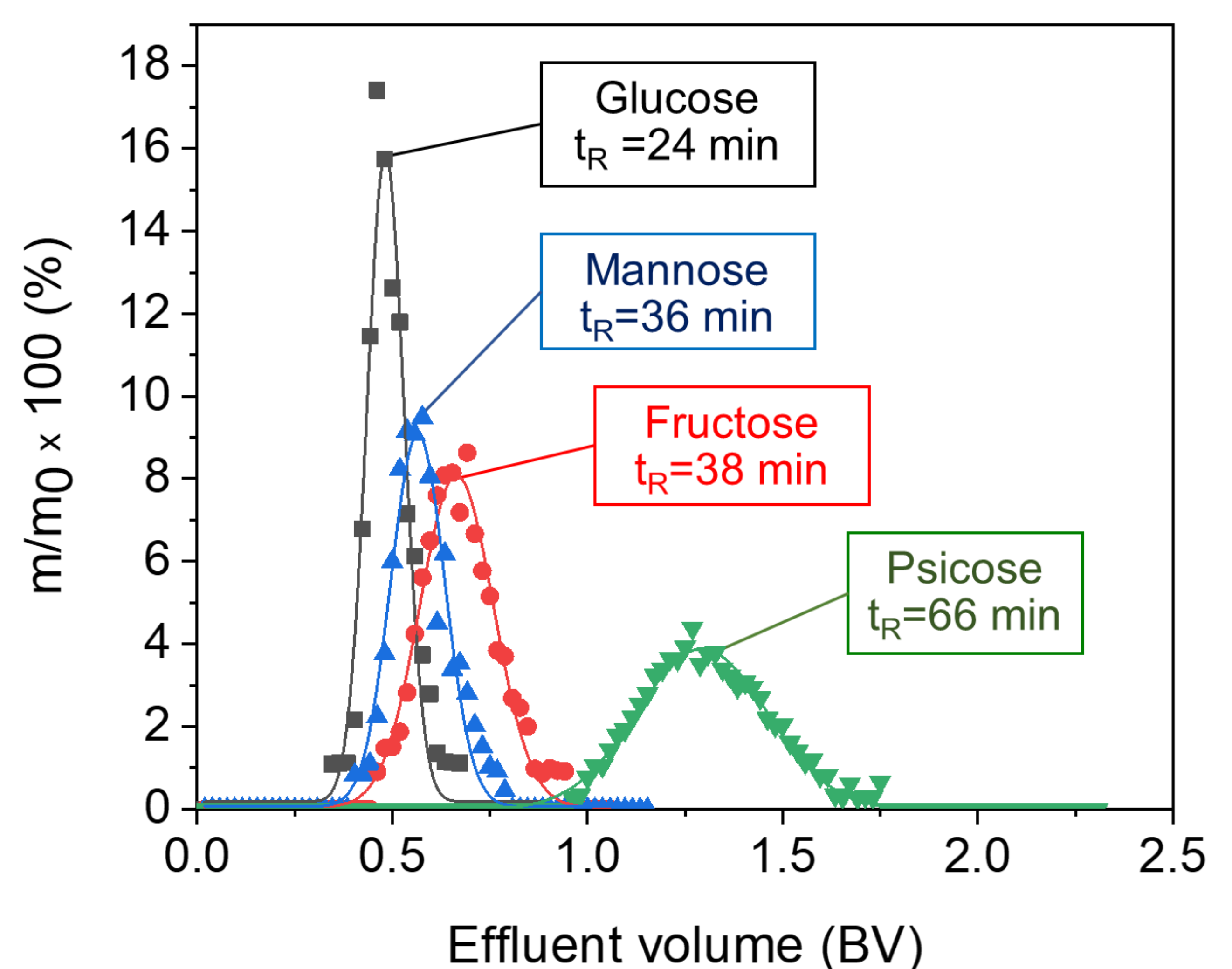


Fig. 3. Elution profiles of sugars.

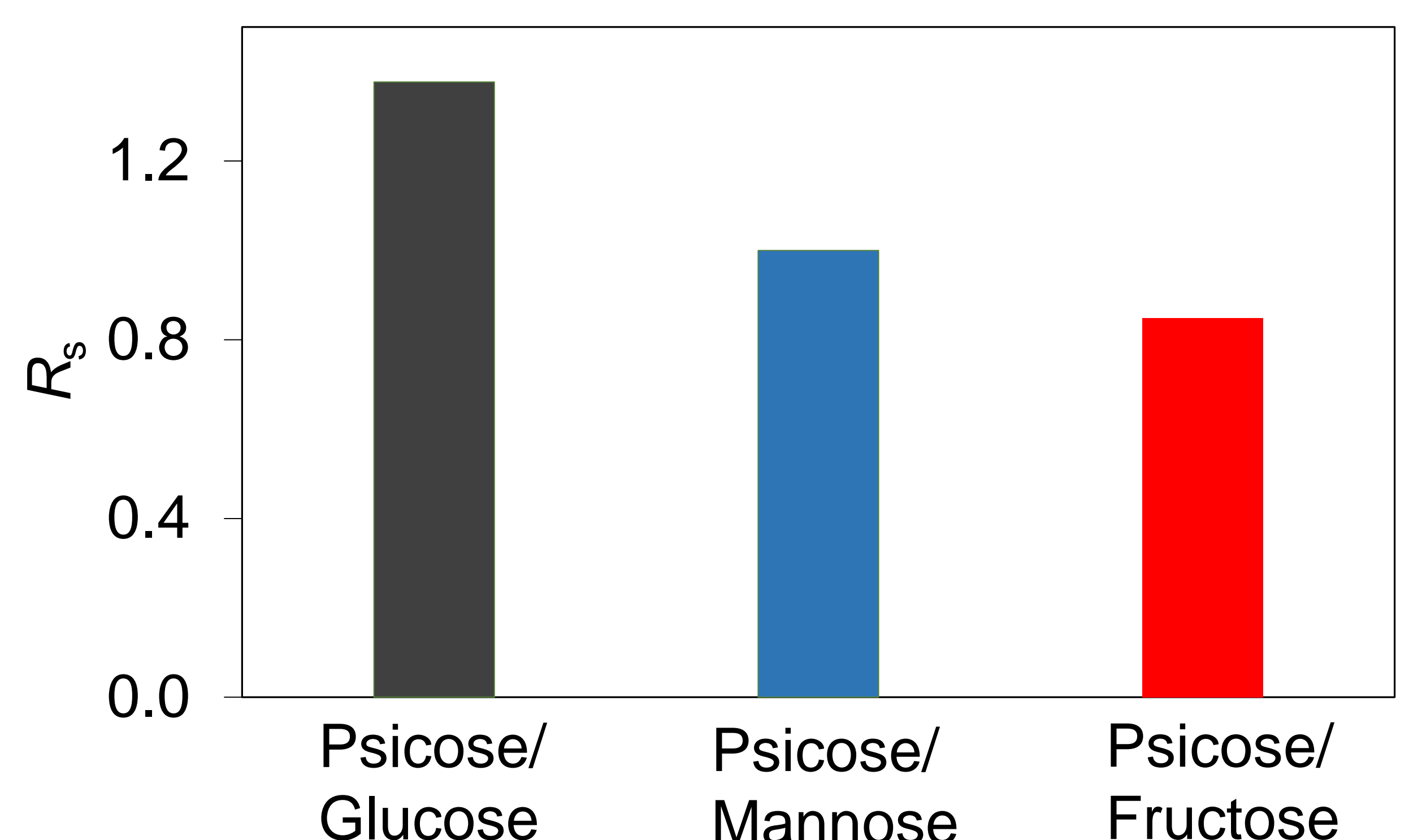


Fig. 4. Resolution for psicose with glucose, mannose, and fructose.

## CONCLUSIONS

This study showed the potential of the column chromatography packed with ion-exchange resin in  $\text{Ca}^{2+}$  form for purification of psicose from the isomerization reaction product.

## ACKNOWLEDGEMENTS

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