Supplementary Material

Bioproduction of Quercetin and Rutinose Catalyzed by Rutinosidase: Novel Concept of "Solid State Biocatalysis".

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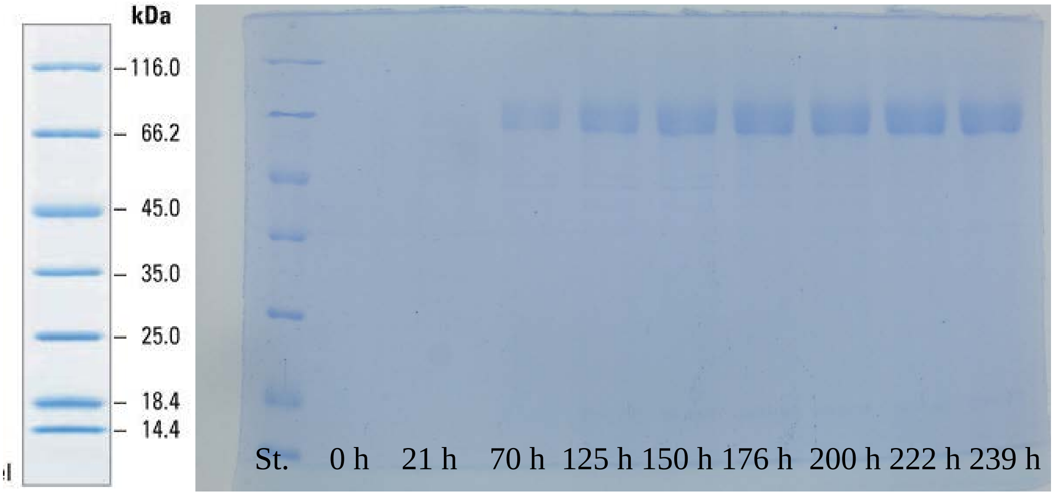

Fig. S1. SDS-PAGE electrophoresis of rutinosidase produced in the fed-batch fermenter; samples from various times of fermentation [hours].

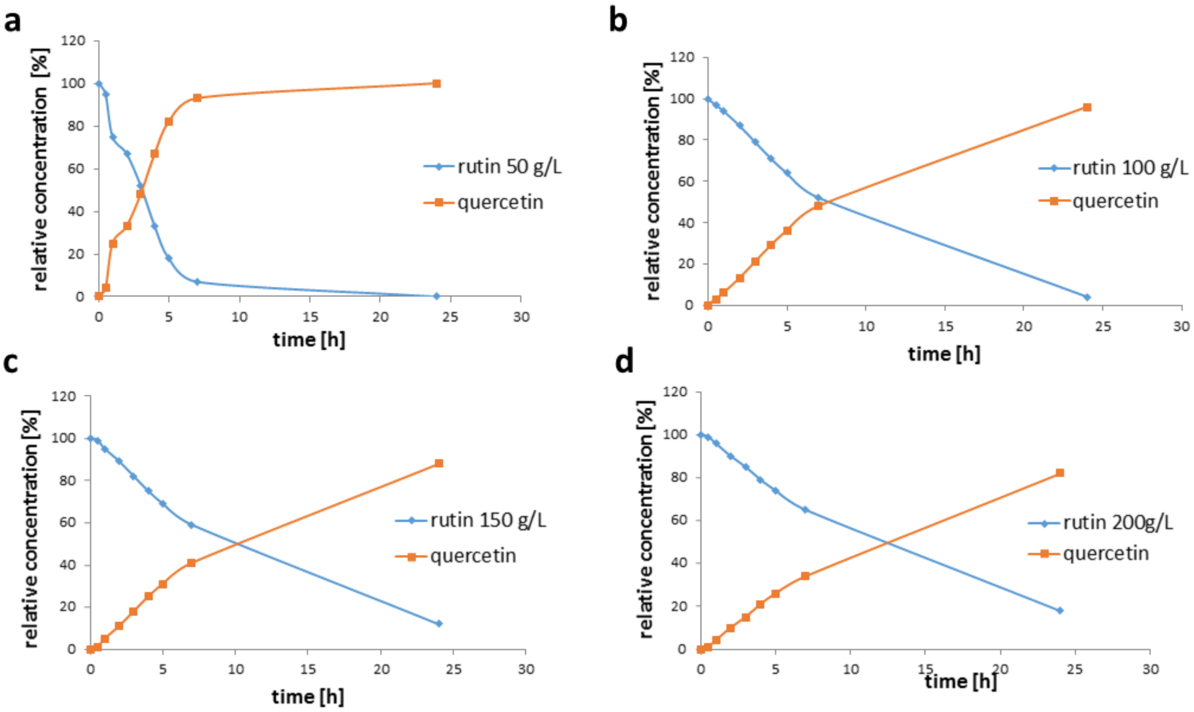

Fig. S2. Bioconversion of rutin to quercetin by crude wild-type rutinosidase. Reaction volume 40 mL; 40 °C; pH 3; rutinosidase activity 0.15 U/mL; rutin concentration (a) 50 g/L; (b) 100 g/L; (c) 150 g/L; (d) 200 g/L.

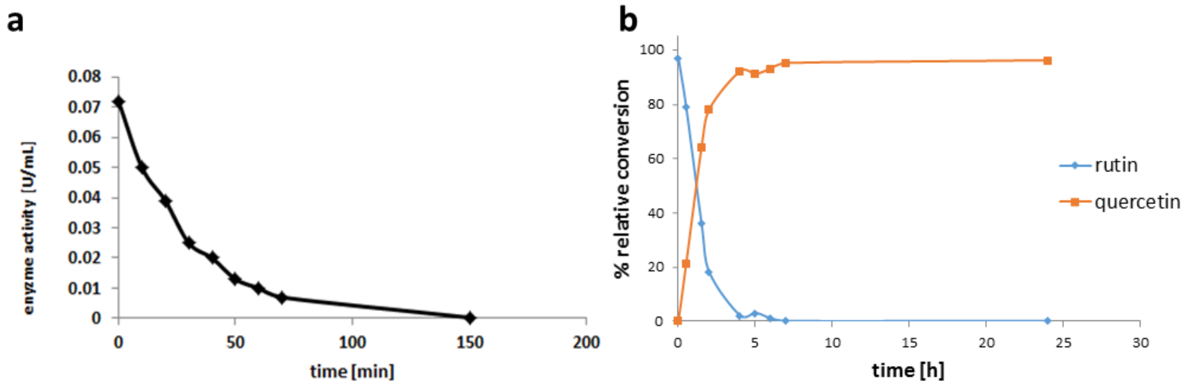

Fig. S3. Performance of crude recombinant rutinosidase at 50 °C. (a), Enzyme stability at 50 °C (crude medium, pH 3.0, flask fermentation, dialyzed in cellulose tubing cut-off 10 kDa against 10 mM sodium acetate buffer pH 3.6 for 2 h). (b), Bioconversion of rutin to quercetin at 50 °C (0.16 U/mL, dialyzed crude medium, reaction volume 3 mL, pH 3.0, 200 g rutin/L).

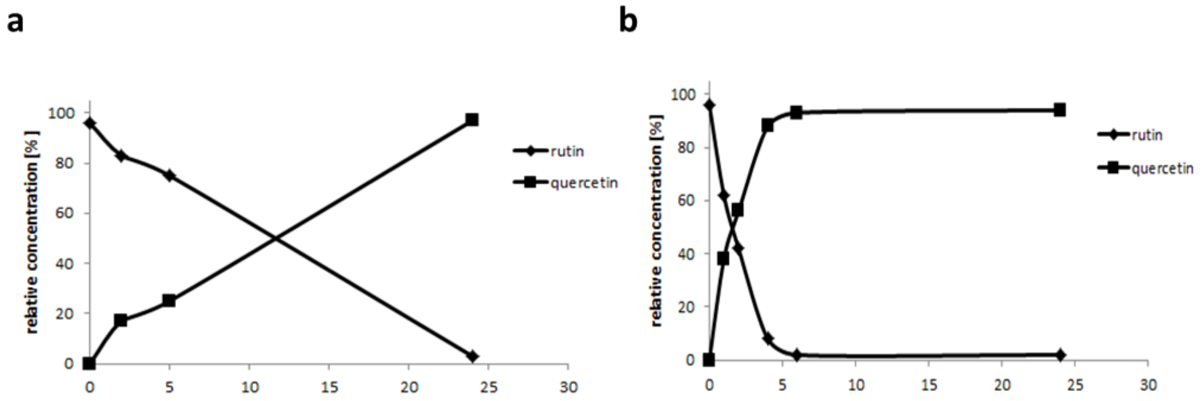

Fig. S4. Bioconversion of rutin with lyophilized crude recombinant rutinosidase resuspended in 50 mM citrate-phosphate buffer, pH 3.0 (a) after slow freezing and 3-month storage at −20 °C or (b) after shock freezing. Reaction conditions: rutin concentration 200 g/L; reaction volume 3 mL; 40 °C; pH 3.0; amount of rutinosidase 0.2 U/mL.

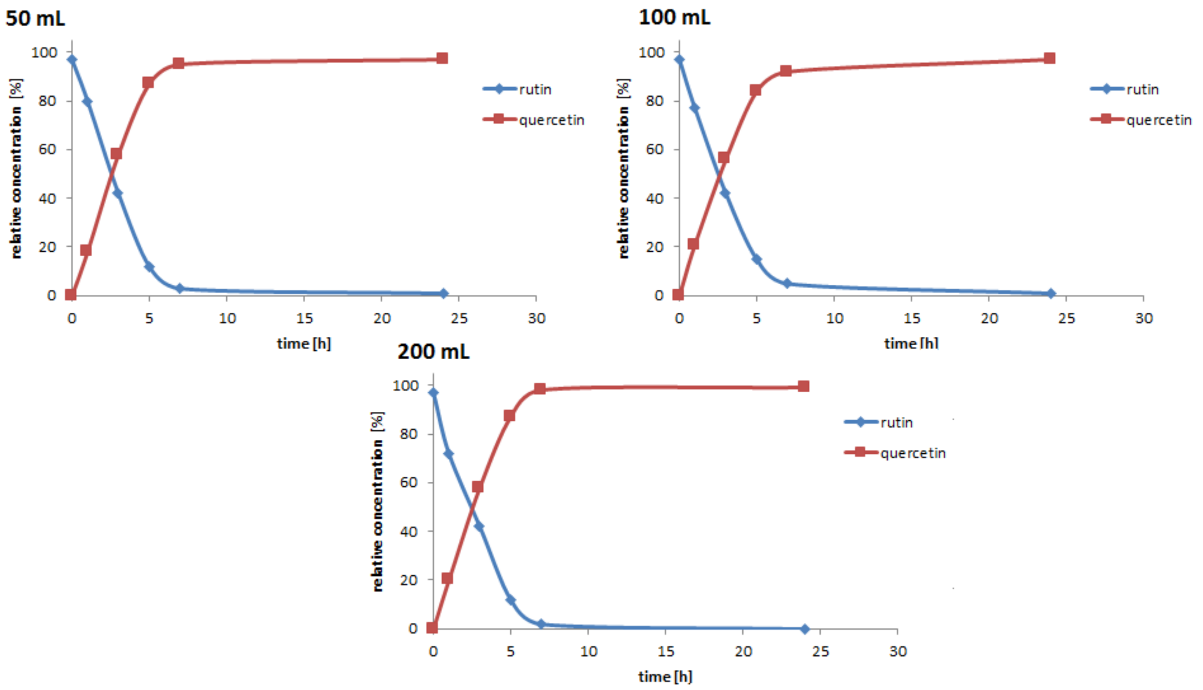

Fig. S5. Scale-up of rutin bioconversion under optimum conditions. Rutin concentration 200 g/L; reaction volume 50 mL; 100 mL or 250 mL; 40 °C; pH 3; crude medium from fermenter with rutinosidase activity 0.2 U/mL.