

Process modification of potential Thai economical tuber crop to be used in microencapsulation for nutraceutical products

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Abstract

Konjac glucomannan is a natural polysaccharide that can be used in biotechnological industries. It has potential to be used as a wall material in microencapsulation process. However, due to its high viscosity it is difficult to feed glucomannan solution into a spray dryer. Therefore, the viscosity needs to be reduced to appropriate level before microencapsulation and spray drying. Hence, this study is aiming at studying the process of modification of rheological properties of konjac glucomannan by employing suitable enzymatic treatments to reduce the viscosity of konjac glucomannan solution as to be used for natural coating materials. The enzymes that are used in this study include α -amylase, cellulase, mannanase and pectinase. The selection of suitable enzyme was determined when using 9% (w/w) konjac glucomannan solution, incubating at 50°C with a speed of stirring of 200 rpm for 8 h. The effect of enzymes on rheological properties of konjac glucomannan solution was studied and the suitable enzymes were selected based on best activity that can reduce viscosity of konjac glucomannan to less than 100 mPa s within 8 hours. The results indicate that mannanase has shown a better activity than pectinase, cellulase and α -amylase. Moreover, enzyme concentration, temperature and stirring speed also influenced the activity of selected enzyme. The information obtained in this study will be used as a process guideline to modify rheological properties of konjac glucomannan solution to be used as natural coating material for microencapsulation.