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Characterization of Starches from Roots of *Panax ginseng* C.A. Meyer and *Panax notoginseng* (Burk.) F.H. Chen

Yoshihide Yamada¹⁾, Keito Boki²⁾ and Masae Takahashi²⁾

1) Yamada Yakken Co., Ltd.

2) Faculty of Pharmaceutical Sciences, Kinki University

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Various physicochemical properties were investigated to assess the potential of starch from the extract of crude drugs (C). Starches (S) were prepared from the roots of *Panax ginseng* C.A. Meyer (PG) and *Panax notoginseng* (Burk.) F.H. Chen (PN). C-PGs and C-PNs contained 5.0-20.0 and 2.0-5.6% starch, respectively. Average diameters of S-PG and S-PN granules were 6.3 ± 1.1 and 11.0 ± 0.7 μm , respectively. S-PGs and S-PNs were classified as C_B-type and C_A-type, respectively. The S-PG-4 and S-PN-4 showed endothermic curves from 44.2 to 69.5 and 51.2 to 72.5°C, their enthalpy being 8.6 ± 0.4 and 11.7 ± 0.7 J/g, respectively. S-PN granules are suggested to be more stable to both moisture and heat than S-PG granules. P contents of S-PGs and S-PNs were 56.0-64.0 and 67.0-120.0 $\mu\text{g/g}$, respectively. Ca contents of S-PGs were 38.0-83.0 $\mu\text{g/g}$, and those of S-PNs were 26.0-180.0 $\mu\text{g/g}$. The digestibility of raw S-PGs and S-PNs by α -amylase was 82.3 ± 4.8 and $55.0 \pm 7.5\%$, respectively, at 72 h. The main oligosaccharide products from the raw starches (digestibility, S-PG-4: 13.2%; S-PN-4: 20.7%) digested by α -amylase were maltotriose (40.2-40.6%) and maltose (36.4-39.1%) and that from the starches (digestibility, S-PG-4: 17.6%; S-PN-4: 27.9%) digested by glucoamylase was glucose (92.9-98.3%). The digested S-PG-4 and S-PN-4 granules (digestion time, 1 h) were roughly eroded by α -amylase and the starches digested by glucoamylase were well maintained to retain their original forms with a few fine grains on their granular surface. It was suggested that the thermostability of S-PG-4 and S-PN-4 digested by glucoamylase

was higher than that of the starches digested by α -amylase.

Key words: crude drug starch, physicochemical property, digestibility by α -amylase, digestibility by glucoamylase, oligosaccharide



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