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Subcritical water extraction and direct formation of microparticulate polysaccharide powders from ganoderma lucidum

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Abstrak

Ganoderma lucidum (hereafter G. lucidum) has been known as a food and raw material used in the development of medications because of its high content of polysaccharides, or ?-glucans, which support the immune function. In this work, subcritical water was applied to utilize G. lucidum for the extraction of polysaccharides at temperatures of 373–463K and a pressure level of 4.0 MPa using a semi-batch system. Furthermore, these extracts were atomized and contacted with hot air to produce microsphere particles. During extraction, thermal softening of G. lucidum occurred, allowing the removal of the polysaccharides and protecting other constituents in G. lucidum via hydrolysis. Scanning electron microscope (SEM) images showed that the microsphere particles formed were spherical and dimpled or shriveled particles with diameters varying from 1 to 6 ?m. Characteristics of the molecular mass revealed that main massed peaks of water soluble products were distributed at around 688–2636 m/z with a peak-to-peak mass difference of 162 m/z, consistent with the repeating unit of the glucans.