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**Microwave-assisted fast and efficient dissolution of silkworm silk for  
constructing fibroin-based biomaterials**

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**Abstract**

A microwave-assisted method was developed for extraction of water-soluble fibroin from silkworm silk. In order to explore enhancing effect of microwave, dissolution profiles of silk fibroin were monitored by protein concentration measurements, showing a faster extraction rate of the microwave-assisted method compared to the conventional methods. Meanwhile, characterization of the resultant silk fibroin regenerated by the microwave-assisted method indicated similarity to that by the conventional methods in that they exhibited similar molecular weight ranges, secondary structures and gelation capabilities. In contrast to traditional microwave-assisted methods, this study employed a laboratory microwave reactor equipped with a feedback temperature control system, which enabled easy control and maintenance of certain reaction temperature and temperature distribution. In this way, the present study, to an extent, resolved possible concerns that uncontrollable extreme

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