

## Ultrasound-assisted Extraction of Red Ginseng

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Red Ginseng is famous for its medicinal benefit among various kinds of red ginseng. Although the medicinal benefit of red ginseng has been known for more than a thousand years and recent study on its effectiveness against various diseases are rapidly developing, the way people make red ginseng extract has remained nearly unchanged. They use water and ethanol at about 80 degree Celsius and soak whole red ginseng in an extraction tank for several hours and repeat the process to obtain more volume of red ginseng extract solution. In this study, red ginseng was immersed in a reservoir which receives 28 kHz ultra sound wave. As the extraction with ultrasound proceeds, the concentration of the main health benefit components of red ginseng, so called panax ginsenosides, were measured with high performance liquid chromatograph to study the effect of the ultrasound wave on the transient extraction process. The water sorption and swelling of red ginseng together with the extraction of ginsenosides were measured to investigate the ultrasound effect. It has been shown that ultrasound wave create implosions on the surface of red ginseng and facilitate mass transfer of ginsenosides.