

OH3) Determination of mineral and trace elements
 in *Ganoderma lucidum* consumed in China,
 Vietnam and Korea

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INTRODUCTION

Interest in traditional medicine has increased over the last decade and seems likely to continue to do so in the future. People now are more prepared to look for alternative approaches to maintain and promote their health. With the increase of public demand, governments have begun to pay more attention to traditional medicine and many areas in the world they have shown a willingness to promote its proper use and to try to integrate it into formal health-care systems. The integration of traditional medicine into the mainstream health-care delivery system is a challenge for countries and areas where allopathic health-care predominates. Some traditional medicine systems are highly developed and well documented. They are based on systematized knowledge, a comprehensive methodology and rich clinical experience. Traditional Chinese medicine falls into this category. It originated in China and was later introduced into neighbouring countries such as Japan, Viet Nam, the republic of Korea and others, which then developed their own variations.¹

The objective of this study is to establish the levels of some mineral and trace elements (Al, Ca, Fe, K, Mg, Se, Ba, Co, Cu, V, Pb, Hg, Cd and As) in some samples of *Ganoderma lucidum* and their infusions collected in China, Vietnam and Korea.

EXPERIMENTAL

Standard reference materials, samples and reagents

Unless stated otherwise, all chemicals of the highest purity were used and they were purchased from Daejung Chemicals & Metals Co. Ltd, Korea. For preparation of all solutions and samples, high purity water from a Mili-Q system (Millipore, Milford, USA) was used. HNO₃, H₂SO₄, H₂O₂ are analytical grade. During the experiments, all glassware and equipment were carefully cleaned starting with 2-4% HNO₃ and ending with repeated rinsing distilled deionized water to prevent contamination.

The calibration curves were made from a multi-element standard solution

(PerkinElmer, CT, USA)

Nine Reishi samples were purchased from different local pharmaceutical stores in Korea, China and Vietnam. The nine samples were either black or brown in color.

The nine Reishi samples were numbered from 1 to 9, respectively. The five samples from 1 to 5 in which samples number 4 and 5 are natural Reishi were Korean Reishi and were purchased from some oriental herb stores in Gyeongsang-Buk province, Korea. Sample number 6 is Chinese Reishi was collected in Vietnam. Sample number 7 is Chinese Reishi, and sample number 9 is Korean Reishi, both were purchased from Daegu Haany University Oriental Hospital, Daegu, Korea. Sample 8 is Vietnamese Reishi and was supplied by Vietnamese Agricultural Genetic Research Institute, Hanoi, Vietnam.

RESULTS AND DISCUSSION

In the present work, fourteen elements were determined in the nine samples numbered from Sp-1 to Sp-9 respectively. In the samples, as well as the infusions and blanks, the quantitative determinations were carried out by a calibration curve obtained by using multi-element standard solutions in which the concentrations of the elements were in the optimal measurement range (0.1, 1, 10 ppm).

The concentrations of fourteen elements determined in nine samples and their infusions are collectively listed in Table 2. It is also the percentage of each element reporting to the infusion. It was observed that all samples contain significant values of elements and their infusions presented a wide variability.

Table 3. Daily need of the world's daily average uptake of elements by a person weighing 70 kg.¹²

Element	ADDIs mg/day (Range)
Ca	1000 (800-1200)
Mg	350 (300-400)
Fe	15 (10-28)
Al	5 (2-10)
Cu	2.5 (2-3)
Ba	1.1 (0.65-1.7)
Co	0.04
Pb	0.415
Cd	0.057
K	3800 (1900-5600)

CONCLUSIONS

A method for detection of fourteen elements (Al, Ca, Fe, K, Mg, Se, Ba, Co, Cu, V, Pb, Hg, Cd and As) in the medicinal fungi Reishi collected in China, Vietnam and Korea

was established.

Our studied demonstrated that all the sample of Reishi that are widely used in China, Vietnam and Korea do not contain toxic elements and their infusion maybe a good source of essential elements.

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