

Abstract of Presentation

Note: This paper should be typed in “Times New Roman” of 12pt.

Presentation Title (Should be no more than 20 words):

Standardization of Natural Medicine through Integrated Approaches:

An Example of Systematic Analysis of Ginseng Drugs

Shu Zhu, Katsuko Komatsu

Institute of Natural Medicine, University of Toyama

Abstract :

Natural medicine has been widely used not only in traditional medicine systems but also as raw materials of health foods. Due to the natural resources, quality and efficacy of natural medicine depends on many factors, such as different botanical sources, growth stage and environmental condition of original plants, collecting season, etc. Standardization and quality control are always the core items for ensuring the safety and efficacy of natural medicine. Our studies on Ginseng drugs included phylogenetic analysis, molecular identification, chemical evaluation and bioactivity assessment to provide basic data for the standardization. Ginseng drugs, derived from roots and rhizomes of *Panax* species (Araliaceae), are the most important group of herbal medicines in the Orient. More than 10 *Panax* taxa are available as medicinal resources, all of which show high potential to cure various diseases. In this study, 13 *Panax* taxa as well as their derived ginseng drugs were world-widely collected. Genetic analysis showed that 13 *Panax* taxa had the species-specific sequences in the plastid *trnK* gene and nuclear 18S rRNA gene regions and the sequences provided much insight into phylogenetic relationship as well as taxonomy within the genus *Panax*. Based on the 18S rRNA gene sequences, a DNA microarray were further developed for authentication of Ginseng drugs. Quantitative determination of 11 main saponins with 4 typical types of aglycones in Ginseng drugs derived from 12 *Panax* taxa revealed that each ginseng drug from different taxa possessed its own characteristic constituent pattern. The relationship observed between *trnK*/18S rDNA sequences and saponin constitutions of *Panax* taxa suggested that determination of the two gene sequences could be used not only for an accurate authentication but also for a speculation of the chemical constituent pattern. Bioactivity assessment is focused on the capability of ginseng drugs on regenerating neuronal network in the dementia brain. The methanol extracts of Red and White Ginseng, Notoginseng and Ye-sanchi were found to have neurite outgrowth activity. Among their constituents, four protopanaxadiol-type saponins showed significant neurite outgrowth activity. This systematic evaluation led to integrative understanding of ginseng drugs and provided evidence-based information for standardization.