Molecular authentication of *Gynostemma pentaphyllum* through development and application of random amplification polymorphic DNA sequence-characterized amplified region marker

J. Zhou[1,2], Y.S. Wu[1], R.Q. Zhao[1], J.F. Jiang[1], Y. Luo[1], C.T. Ma[1] and J.Y. Qian[1]

[1]Department of Biochemistry and Molecular Biology,
Key Laboratory of Biological Molecular Medicine Research,
Guangxi Medical University, Nanning, Guangxi, China
[2]College of Life Science and Technology, Center for Human Genome Research,
Huazhong University of Science and Technology, Wuhan, China

Corresponding author: Y.S. Wu
E-mail: wuyaosheng03@sina.com

Genet. Mol. Res. 14 (4): 16204-16214 (2015)
Received August 22, 2015
Accepted October 1, 2015
Published December 8, 2015
DOI http://dx.doi.org/10.4238/2015.December.8.10

ABSTRACT. Due to the morphological similarities of aerial parts, it is difficult to distinguish *Gynostemma pentaphyllum* from *Cayratia japonica*, which is usually an adulterant of the former. To develop a reliable method for the identification and authentication of *G. pentaphyllum*, a combination of random amplification polymorphic DNA (RAPD) technique with sequence-characterized amplified region (SCAR) markers was studied. Twenty-five samples of *G. pentaphyllum* and two samples of *C. japonica* were collected from different regions in Guangxi or bought from different provinces in China. Through the RAPD analysis, significant genetic polymorphism was observed among the intraspecies samples of *G. pentaphyllum.* Furthermore, a specific marker, J-750, was obtained for authentication.

Therefore, the SCAR marker for *G. pentaphyllum* (359 bp) was developed from the RAPD amplicon. With PCR amplification using the SCAR primers, a specific band of 359 bp was distinctly visible for all tested samples of *G. pentaphyllum*, but was absent in the samples of *C. japonica*. Furthermore, the results revealed that the SCAR marker was useful for the identification and authentication of *G. pentaphyllum* irrespective of whether samples were fresh, dry, or of commercial origin. The SCAR marker obtained in this study successfully authenticated *G. pentaphyllum* through an integrated PCR system containing SCAR and control primer combinations of two pairs. In addition, it was also used for simultaneous discrimination of *G. pentaphyllum* from *C. japonica*.

Key words: Sequence-characterized amplified region; *Gynostemma pentaphyllum*; Random amplification polymorphic DNA; Molecular authentication

