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### Detection of adulteration/substitution of herbs - A quality control perspective for herbal industries

C. Gururaj, U V Babu and R Shyam Ramakrishnan  
The Himalaya Drug Company, India

The primary healthcare in most of civilised societies is based on herb based medicines. Yet still fuzziness exists in its authenticated herbs, safety, efficacy & stability in the society as a whole.

Over 75% of the world population relies mainly on plants and plant extracts for health care. The herbal Industries are mainly depending on the plant materials that are collected from the nature. This imposes a constraint on available natural resources and no control over the quality of the material that is being used. Standardization of herbal formulation is essential in order to assess the quality of drugs. This assessment is of paramount importance in order to justify their acceptability in modern system of medicine.

When specific plants, including those used in traditional medicine, suddenly become of interest to the world at large, the local wild sources soon become exhausted. Due to sudden surge in requirement leads to adulteration or substitution. Adulteration is a practice of substituting the original crude drug partially or fully with other substances which is either free from or inferior in therapeutic & chemical properties. By addition of low grade or entirely different drug similar to that of original drug substituted with an intention of economic gains.

In general, adulteration is considered as an intentional practice to increase the weight or to reduce its cost. However unintentional also exists in herbal raw materials trade due to various reasons. Advancement in identification of raw materials, in the field of herbal drugs indicates the beginning of herbal renaissance. To overcome these complications, DNA fingerprint techniques are very useful in correct identification of taxa, and thus preparation of authenticated and effective drugs. To assess in depth we resorted to modern technique such as RAPD, IISR, AFLP etc. These approaches may lead to herbal industries during drug delivery and also major leap towards globalization of this sector.

The RAPD technique has been widely used to detect polymorphism, cultivars, discriminate between wild and cultivated species and detect agronomic traits. The present aim of the study is to investigate the DNA based marker profiles through RAPD finger prints for possible adulterations and substitute kinds. We have taken two illustrations for adulteration & substitutes from suppliers, *Tribulus terrestris* vs. *Pedaliium murex* is plunge on earlier category and *Momordica charantia* vs. *Momordica charantia* var. *muricata* is a substitute form. These plants were employed to develop to reproducible markers for authentication of these species. The random decamer oligonucleotide primers (24) were screened for these samples using the DNA isolated from the dried fruits of all samples. Out of 24 primers, some gave species-specific reproducible unique band and the remaining did not amplify the DNA. Chemical investigations through HPTLC also demark the plants by its fingerprints with the quantification of marker principles for further confirmation. This kind of activities may be due to intentional or unintentional malpractice in trade. Major reasons are confusion in name; non availability & lack of knowledge about authentic plants. Based on RAPD could thus, serve as a complementary tool for quality control and we can substantiate adulterated herbs during the initial process.

#### Biography

C. Gururaj is currently working as Senior Research Scientist in R&D centre, The Himalaya Drug Company, Bangalore. He completed his post graduation in Botany (specialisation in medicinal plants) in 1996 and obtained his MPhil and Ph.D. from Gulbarga University, Karnataka in 2002. He also completed his post doctoral studies at Academia Sinica, Taiwan, where he has worked on T-cell activation & differentiation to access Bio-active compound pathway from herbal compounds. He is a botanist by profession and works in the area of medicinal plants cultivation, tissue culture and biotechnology. In Himalaya, he heads the plant tissue culture and biotechnology section, where the main focus is on propagation of medicinal plants, its conservation, authentication and value addition through biotechnology tools. Dr. Gururaj has more than 10 research publications in peer reviewed international and national journals in his credit.

[dr.gururaj@himalayahealthcare.com](mailto:dr.gururaj@himalayahealthcare.com)