PRAKRUTI
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"DNA Barcoding: tool for identification of Herbal material"

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Why it's important

Adulteration and substitution of raw herbs have become a widespread problem in the herbal industry due to deforestation and extinction of many species as well as incorrect identification of many plants. The term adulteration specifies a number of conditions, which may be intentional or accidental. The crude herbs are substituted with inferior material or unlabelled fillers. This reduces the efficacy and therapeutic potential of original herbs, which in turn leads to loss of consumer faith.

Prior to the advent of modern molecular tools, morphological and anatomical descriptions were the only primary means of plant identification, which usually involve description of variation for morphological traits by expert taxonomist and trained technicians through experience.

Pharmacognostical study involving physical, chemical and sensory characters of raw herbs, both in whole state and in powder form paved the way for quality sourcing of crude herbal materials. Asserting the physiochemical properties of herb by comparing with the standard values of Pharmacopoeia was another means to the authentication

The accurate identification of medicinal plants in relation to their purity and quality as well as safe application has become increasingly important.

The conventional approach is to engage an expert taxonomist, who uses a mix of traditional and modern techniques for precise plant identification. However, for bulk identification at industrial scale, the process is protracted and time-consuming. DNA barcoding, on the other hand, offers an alternative and feasible taxonomic tool box for rapid and robust species identification.

DNA barcoding is an established technique that uses the sequence diversity in short, standard DNA regions for species-level identification. It is primarily used to identify known species by comparing their unique barcode sequences to reference sequences in public databases, as well as to facilitate species discovery. DNA barcoding provides a more rapid, subjective, and accurate identification compared with traditional methods. Thus, it has rapidly become a widely recognized tool for species identification.

Case study

The fruit rind of Garcinia gummi-gutta, commonly known as Garcinia cambogia (syn.), is extensively used traditionally.

Garcinia cambogia-derived (-)-hydroxycitric acid (HCA) is a safe, natural supplement for weight management. Used extensively worldwide for many food and dietary supplement formulations. Garcinia cambogia is commonly substituted or adulterated with other species of Garcinia like Garcinia indica etc.

In a recent research conducted in external lab, **DNA barcoding** of Prakruti Products Garcinia sample was carried out.

PCR (Polymerase Chain Reaction) of Prakruti Garcinia sample with three candidate DNA barcode gene primers (rbcL / trnH-psbA / ITS2) was carried out using Agilent SureCycler 8800.

The PCR amplification profile was checked on agarose gel and the product size was compared with a size ladder of 100bp.

Two genes showed similarity to Garcinia gummi-gutta (also known as Garcinia cambogia) species while one showed similarity to Garcinia cowa species. Thus, on the basis of the two genes showing same species hit, **researchers conclude that the Prakruti Garcinia sample is Garcinia gummi-gutta (Garcinia cambogia)**

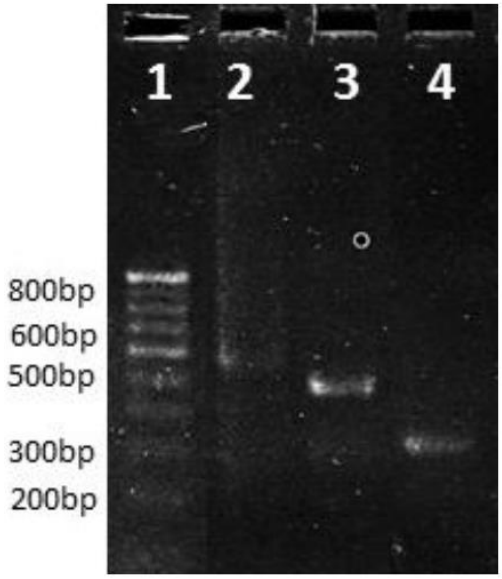

Figure: The PCR products were resolved on 2% Agarose gel. The gel was visualized under UV light and the image was captured.

Lane 1: 100bp ladder, Amplification product of the sample Garcinia with (A) rbcL - Lane2 , (B) ITS2 - Lane3, (C) trnH-psbA - Lane 4

GarSol™ is a standardized extract of Garcinia cambogia with 100% water solublility.

To know other grades of Garcinia cambogia please visit www.GarSol.in

For more information on the study, please write to us: shiv@prakruti.com