

ABSTRACT

SCIENTIFIC ANALYSIS OF SELECT MEDICINAL PLANTS FROM AN *AYURVEDIC* PERSPECTIVE

V Ganesh Prabhu
(Awarded, 2014)

Modern medicine is evidence based and practices the use of discrete, well- defined chemical entities for the treatment of diseases. Ayurveda, the time-tested medical practice of India is based on usage of a diversity of botanical resources. It has in-depth understanding of the therapeutic properties of plants, which are on tune with the theory and parameters of Ayurveda. The treatment method in Ayurveda aims to remove the disease causing factors and the restoration of the equilibrium of bodily functions and tissues (doshas and dhatus) in a way which is compatible, conductive and nourishing to patients without weakening them. Ayurveda classifies doshas in to three major systems: Vata, Pitta and Kapha popularly known as tridosha, deals with the system of regulatory function, each with a particular area of responsibility. The fundamental aim of ayurvedic therapy is to restore the balance between these three systems.

The entire material medica of Ayurveda is classified according to rasa (literally called taste). Rasa is a major parameter in ayurvedic pharmacology. Nearby 8,000 plant parts such as roots, leaves, fruits, flower, seeds, etc. have been characterized in Ayurveda according to the six rasa. A medicinal plant may contain – a single rasa or a combination of rasa.

In this research five medicinal plants viz. Atibala (*Abutilon indicum* Linn), Kusmanda (*Benincasa hispida* thumb), Tala (*Borassus flabellifer* Linn), Jivanti (*Leptadenia reticulata* Retz., Et. & Arn.), and Bala (*Sida cordifolia* Linn), classified under the same taste category (madhura rasa/sweet) have been selected. Identification of chemical compounds responsible for sweet taste was carried out by modern analytical techniques like HPLC, electronic tongue, Nuclear Magnetic Spectroscopy, Fourier transform infrared spectroscopy and AAS were carried out.

The sugar content of samples were found appreciable amount. Taste identification of the samples by electronic tongue by comparing with standard taste compounds like cellobiose, galactose, glucose, mannose, sucrose, xylose, NaCl, caffeine, urea and citric acid explained the taste pattern of the samples. Principle component analysis of the sensor data shows that all the five plants are clustered together with identical taste. Further data analyses by SIMCA modeling and PLS regression, the taste of the medicinal plants revealed as sweet.

In the proton NMR study, the presence of sugar compounds observed for all samples. The data analysis revealed that all the samples are grouped together on basis of taste. It shows similarity of taste exist between glucose standard and samples. Cluster analyses of the NMR data were conducted to determine the clustering pattern among the samples.

A comprehensive compilation of the data analysis shows that medicinal plants of present study could be grouped under single taste category as sweet. These findings indicate that prima facie there is correspondence between taste determination of medicinal plants using modern analytical tools and the traditional classification of Ayurveda. Physico-chemical and spectroscopic metabolomics of medicinal plants give support to identify and categorize according to the biochemical constituents. The presence of significant amount of sugar compounds in all the plants was confirmed by HPLC analysis. Taste profiling by electronic tongue also confirmed the sweetness present in all the plants taken in this study. The spectroscopic analysis shows the presence of carbohydrates viz. glucose, sucrose, fructose, galactose and

mannitol. All the tests have demonstrated that the selected medicinal plants in Ayurveda may lead to many studies in future that would validate the ayurvedic concept of rasa based classification of medicinal plants.