

Instrumental neutron activation analysis (INAA) and atomic absorption spectroscopy (AAS) for analysis of medicinal herbals from India for major, minor and trace nutrients as food supplements to overcome malnutrition

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Malnutrition is the major problem not only in India but also in the world. Almost half the children in India suffer from malnutrition. Natural sources of nutrients through medicinal plants provide not only the nutrition but also that are useful in the treatment of different diseases without /less side effects, less expensive and easily available.

Present work deals with Instrumental Neutron Activation Analysis (INAA) and Atomic Absorption Spectroscopy (AAS) which are the powerful and very fast, sensitive and selective analytical tools for the major, minor and trace nutrients analysis of traditional medicinal plants herbal from India used in the treatment of different diseases and as food supplements.

Medicinal herbals are enriched with number of minerals and vitamins. Fortification of foods with micronutrients is very essential. Alleviating malnutrition by providing cost-effective technologies to fortify commonly eaten foods viz. herbals, to assure nutritional safety of fortified foods is the main aim of the study. The herbals which are generally consumed by the local people were purchased from market and were analyzed by Instrumental Neutron Activation Analysis (INAA) using ^{252}Cf spontaneous fission neutron source available at Department of Chemistry, University of Pune, India. The induced activities were counted by γ -ray spectrometry and Atomic Absorption Spectroscopy (AAS) techniques using Perkin Elmer (3100 Model) for the measurement of major, minor and trace elements. 15 essential major, minor and trace elements Al, K, Cl, Na, Mn by INAA and Cu, Co, Pb Ni, Cr, Ca, Fe, Zn, Hg and Cd by AAS were analyzed from different Indian herbals.

A critical examination of the data shows that all these elements are present in the herbals at major, minor and trace levels. The elements Ca, K, Cl, Al and Fe are found to be present at major levels in most of the samples while the other elements Cu, Co, Ni, Cr, Ca, Fe, Zn are present in minor or trace levels. Pb, Cd and Hg are below the permissible levels. These medicinal herbs are safe to consume as the differences in the concentration of the elements are attributed to soil composition and the climate in which the plant grows. The elemental concentrations in different herbals from India are discussed.

The data is useful to medical practitioners, pharmacists as well as food analysts and the researchers.

Biography

B. M. Pardeshi has completed her Ph.D. in Chemistry in 1997, M.Sc in Physical Chemistry in 1987 and M.Ed in 1996 from University of Pune, India. She has attended more than 33 international and national conferences and presented and published research papers in reputed journals and 3 books of Chemistry. Her research interest is analytical chemistry, antioxidants, free radical scavenging study, radioactivity, neutron activation analysis, spectroscopy, soil and water pollution, metal analysis. She is working as Assitant Professor of Chemistry at senior level from last 20 years in Pune District Education Association, Pune, India. She is research guide of chemistry and environmental science. Presently, eight Ph.D. and M.Phil students are doing research under her guidance. She is recipient of number of awards.

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