Preface

The study of natural products of established or potential therapeutic values has been and is of great fascination not only because of the medicinal applications of the active principle involved but equally as an intellectual exercise in understanding nature’s process and purpose to be able to comprehend nature, to imitate and perhaps to improve on it, has been one of man’s oldest and most cherished dreams.

In recent years, there is resurgence for alternate medicine movement globally, health care obtained from physicians, pharmacists and other professionals needed to be supported by safe and cost effective and more accessible health products. It is in this delicate balance of health care and surge for alternate medicine, the field of “Nutraceuticals” emerges. Thus, the term nutraceutical denote the nutritional origins and the design molded on pharmaceuticals, that is, standardization, efficacy and predictability.

Plants have played a significant role in maintaining human health through ages. Some plants are known to contain a variety of chemical compounds known as “phytochemicals” which include flavonoids, tocopherols, catechins to name a few. Scientific evidence is accumulating to support the role of phytochemicals and functional foods in the prevention and treatment of diseases. More than 5,000 phytochemicals have been identified, but a large percentage remains unknown, and need to be identified before their health benefits can be fully explored.

In India, a variety of native herbs are widely used today, for a host of common ailments and conditions such as, anxiety, arthritis, colds, infections, intestinal disorders and so on. Some of the more popular herbs in use today include aloe vera, Echinacea, garlic, ginger, ginkgo, ginseng, goldenseal, mulberry, turmeric and lots of other herbs.
Pharmacognosy builds a bridge to chemistry and pharmacology of natural medicinal products and pharmacology is related to the knowledge concerning drugs. Since 1980 the pharmaceutical industry preferred to concentrate on natural compounds known to have a desirable medicinal effect. After elucidation of the structure of the natural compound there was a hope to devise this synthesis of compound in economic scale which would free the manufactures from isolation procedures using difficulties in availability of starting plant tissue in which the active principle occurred in low concentrations. However, present synthetic methods cannot compete with extractions of active materials from medicinal plants. India has many number of plant species and medicinal properties have been assigned to several thousands. Many major institutes and research centers are currently involved in exploring this opportunity to investigate newer drugs from ancient principles of ayurveda.

Analytical Chemistry as a scientific entity has played a major role in facing the challenges taking place in the nutraceutical industry. Traditionally viewed as a service organization, of late the analytical department has become a significant partner taking a major role in nutraceutical development processes. Indeed, the demand for analytical data has become very critical for the selection of candidate molecules for full development. Working under sample-limited conditions and in full compliance of current good manufacturing practices, nutraceutical analysts are called on to generate accurate and precise data - almost on demand. The science and technology utilized today, coupled with the new regulations that are now binding, have made nutraceutical analyses much more complicated compared to what it was as about ten years ago.

Analytical data is the basic need and backbone for nutraceutical development, for new drug approval and for their commercial production for the market. Simple and cost-effective analytical methods and methodologies are very much desirable not only for quality assurance of the products, but also to check adulteration without compromising on sensitivity and reliability of the data.
This thesis is an attempt to follow the basics of pharmacognosy, pharmacology and analytical chemistry disciplines which supports nutraceuticals discovery, development and post market support. It is my intention to present the role of pharmacognosy, pharmacology and analytical chemistry for the development of nutraceuticals. For this reason, the nutraceuticals isolated and characterized are more of need based in part II and part III is based on functional academics. Besides, the format followed in this thesis deviates from the conventional style. I hope this new trend will meet the approval.

Narasaraju ENK Murthy