

society. Its objectivity, the fine quality of the arguments and analyses, and overall readability would also have definite value to academic sociologists and historians with an active interest in the study of science. However, the terminology and concepts used in the book have the in-built constraint that they must be accepted by academics of that particular subset. A majority of practising scientists would not be familiar or care to understand words such as 'realistic constructivism and constructive realism', 'triumphalist vision of modern science', etc. In other words, the untrained mind, especially one unfamiliar with academic social sciences, could find it heavy-going.

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**Quality Standards of Indian Medicinal Plants.** A. K. Gupta (co-ordinator) Vol. 1, Indian Council of Medical Research, P.O. Box 4911, Ansari Nagar, New Delhi 110 029. 2003. 262 pp. Price: Rs 600; US \$ 40.

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Herbal medicine (based on plants), also referred to as alternate medicine/traditional medicine/complementary medicine, has been in use in India since time immemorial. Nearly 70% of the human population is reported to be dependent on plant-based medicines. The current value of the Indian system of medicine (Ayurveda, Sidha and Unani) and homeopathy is estimated to be around Rs 4000 crores. Over 8000 plant species are reported to be used to prepare some 25,000 formulations to treat various ailments. Even in Western countries, there has been a renewed interest in herbal drugs and the demand for plant-based drugs has increased dramatically in recent years. The current global market of medicinal plants-related trade is estimated to be around US \$ 62

billion. However, the global market for Indian herbal drug industry is yet to be exploited fully. One of the most important reasons for this under-exploitation has been inadequacy or non-availability of quality standards for herbal medicine. For developing drug standardization, the quality of base material used for formulating the herbal products is a prerequisite.

Since the materials used in herbal drugs are traded mostly as roots, bark, twigs, flowers, leaves, and fruits and seeds, visible authentication of the material used is difficult and has led to a high level of adulteration. To identify and authenticate the materials, the availability of detailed morphological, histological and pharmacognostic information is essential. Identification of active principle(s), wherever it is known, or a biologically active marker compound requires their standardization using appropriate chemical procedures such as TLC, HPTLC, HPLC and GLC.

This volume is an earnest attempt toward fulfilling these major lacunae. It is the result of the initiative taken by the Indian Council of Medical Research (ICMR) for development of standards for about 200 medicinal plants commonly used in India for their therapeutic value. A Task Force involving scientists from four institutions has prepared this first volume containing data on pharmacognostic and phytochemical information along with other relevant data on 32 medicinal plants. Work on the remaining plants is reported to be in progress, with more volumes likely to appear in the coming years. These attempts for developing standards for medicinal plants are only the beginning; it is going to be more difficult to develop standards for herbal drugs. The enormity of the problem has been highlighted in a recent publication in *Current Science* (Sangwan, R. S. *et al.* 2004, **86**, 461–465) describing the results on phytochemical composition of ten products of Ashwagandha (*Withania somnifera*) available in the market. The content of withaferin A (the main active constituent of Ashwagandha) has been shown to be variable by more than 70-fold in different products.

For each species included in the volume, the botanical name along with the authority, family, synonym, plant part(s) used in drug preparation, habit and habitat, English, Hindi and other names available

in regional languages are given. Colour photographs of the plant and parts used in drug preparation are given and this helps to some extent in the identification of the plant/ its parts, even to the layman. A comprehensive account of both macroscopic and microscopic (histological and anatomical) description of the part used along with colour photographs and line diagrams follows. Major and other chemical constituents together with their structures are included. Details of identity test (TLC/GLC) and analytical method(s) (GLC, HPTLC, HPLC) together with the description of the procedure and chromatograms are given. Other aspects included for each species are: quantitative standards, adulterants/substitutes, pharmacology and therapeutic category as mentioned in Ayurvedic texts, safety aspects and dosage. At the end, full references of the cited publications are given. The quality of colour photographs and particularly the line diagrams is generally good.

There are several appendices at the end: methods for evaluation of crude drugs, phytochemical evaluation of raw material, methods for isolation of some markers, drying and storage of raw materials, and pesticides, residues and microbial contamination. These are useful. Indices give botanical names, chemical constituents and other names of the plants.

The volume is certainly the right step toward improving the quality of herbal drugs in the country. It will be useful to the industry (to procure authentic materials that contain essential components as required under pharmacopoeia standards, and thus maintaining the quality of the drugs), drug analytical laboratories, drug control authorities and researchers on medicinal plants. The present volume and the forthcoming publications would help in giving the required boost to the industry. ICMR and members of the task force are to be congratulated for bringing out this quality publication. I hope that the coming volumes in the series are also going to be of the same quality and utility.

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