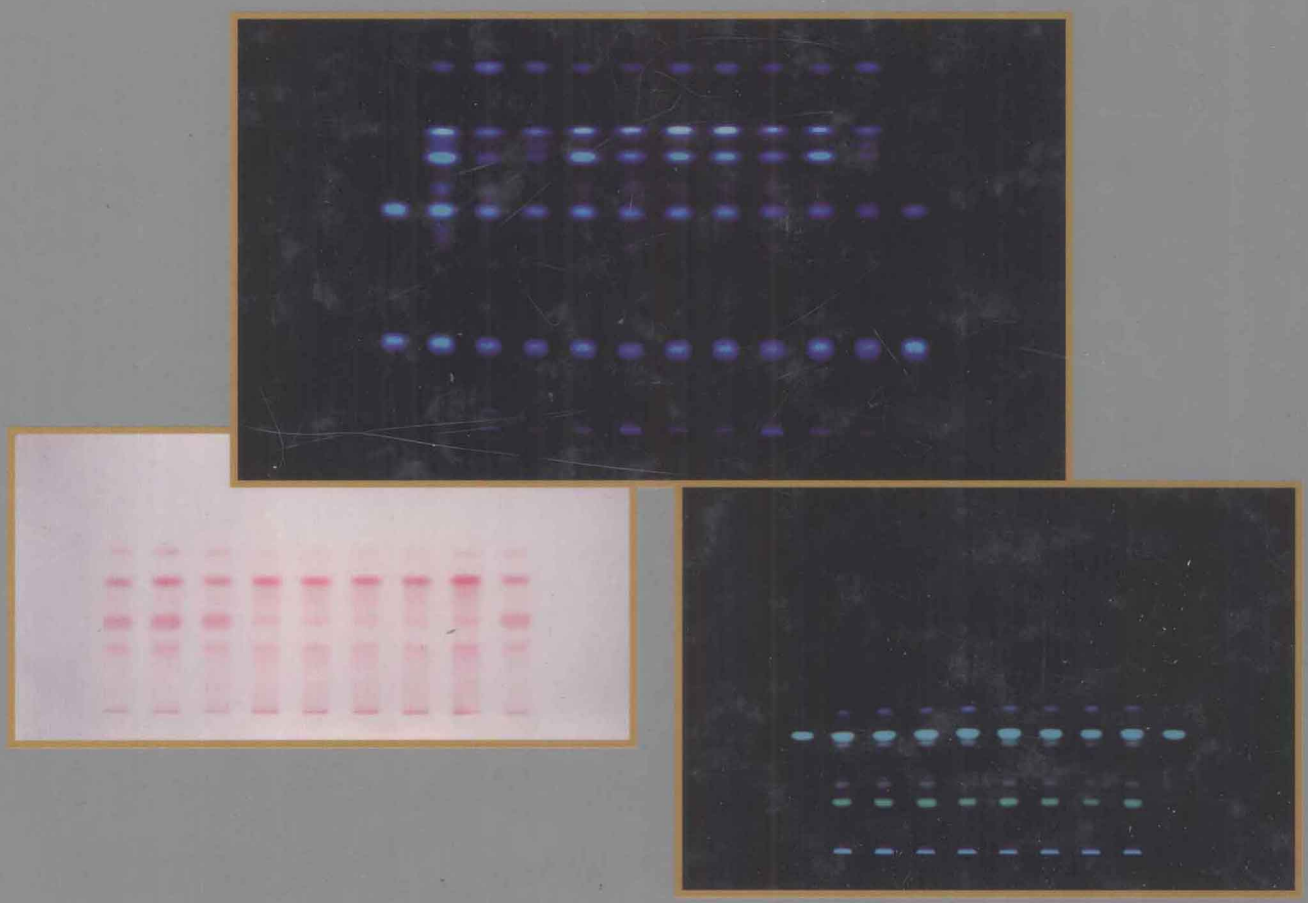
TLC Atlas of Chinese Crude Drugs in Pharmacopoeia of the People's Republic of China

Volume I

Chinese Pharmacopoeia Commission



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PREFACE

As an invaluable legacy left by our traditional culture, Traditional Chinese Medicine (TCM) is still playing an important role in China's health care system today. In his report to the 17th CPC National Congress, President Hu Jin-Tao pointed out that the Chinese government will strongly support the development of Traditional Chinese and ethnic medicines. This policy provides us an unprecedented opportunity to carry forward and develop TCM. It is now generally recognized that Chinese crude drngs is the major material basis for TCM to prevent and treat diseases, and that its quality could largely decide the clinical therapeutic effects. As a matter of fact, quality control of Chinese crude drngs is now the biggest hurdle for the development and globalization of TCM.

Pharmacopoeia of the People's Republic of China (*ChP*) is the legal standard insuring the quality of medications in China. *TLC Atlas of Chinese crude drngs in Pharmacopoeia of the People's Republic of China* is one of the supplementary books of the *ChP*. This book uses elegant pictures and scientific words to illustrate the TLC identification of TCM crude drugs recorded in the *ChP*.

The quality of TCM crude drugs could significantly influence the quality of proprietary Chinese medicines, and finally influence the safety and therapeutic effects of TCM. Thin-Layer Chromatography (TLC) is a rapid, direct, and informative technology for the identification of TCM crude drugs. TLC could reflect their inherent quality and thus can be used for their quality control. Reference drug materials are used in TLC analyses in this book to present the global chromatographic features of Chinese crude drngs, so as to insure the authority and applicability of the *ChP*. I believe that this is unique to the present book.

This book is informative with abundant and solid research data. All the crude drug samples used in the studies are newly collected and represent different geographical sources. The TLC chromatograms were all original data obtained by the authors, and the pictures were taken by high quality digital cameras. More importantly, this book contributes significantly to supplement and improve the TLC methods described in the *ChP*. Therefore, this atlas is not only a legal standard of TLC identification of TCM crude drugs, but also a useful collection of latest research results in this field. I am glad to notice that all the contents in this book are published for the first time. The pictures are highly clear, and the TLC features are easy to be determined. I believe that this book will enhance the quality control research and clinical use of Chinese crude drugs, improve TCM development, and promote administrative supervision of TCM in China.

I truly believe that this book will be found valuable by readers in the areas of TCM drug testing, teaching, research, and manufacturing. An English version of this book will be published simultaneously with the Chinese version. It will enhance our communications in TCM with the world, and serve as a valuable reference for related TCM research and manufacturing personnel outside of China. This book will also help international academic societies and drug administrations to learn the current status in TCM research in China, and will eventually drive the TCM globalization process.

Guo-Wei Sang

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April 15, 2008
Beijing

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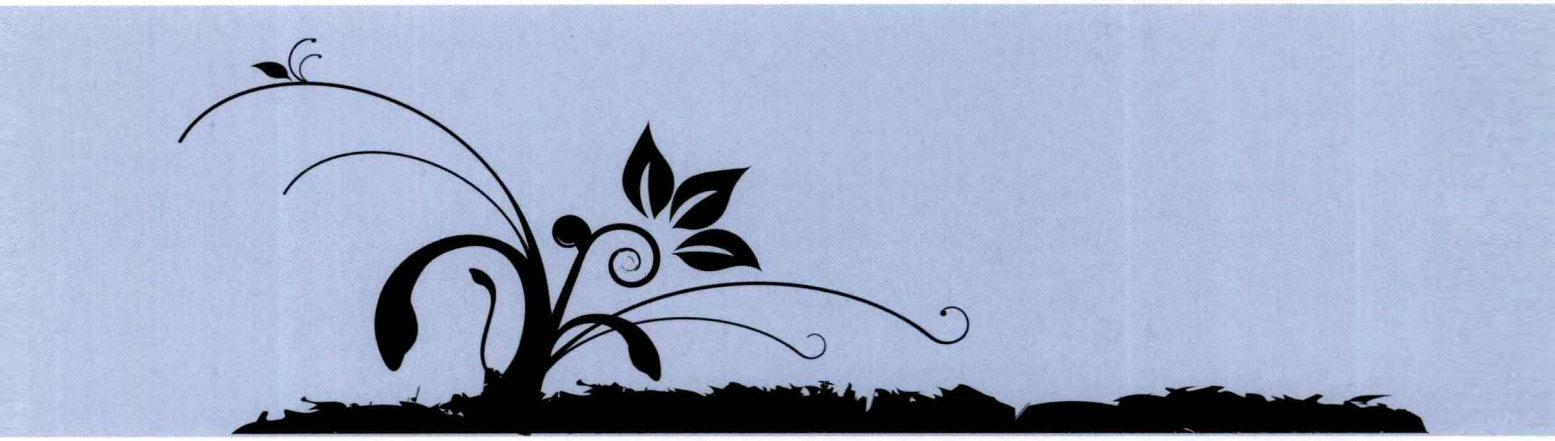

Chapter 1 Overview

The identity and quality of traditional Chinese medicines (TCMs) are directly related to their safety and efficacy. For this reason, the establishment of proper and accurate identification for TCMs is of the utmost importance. Common techniques in identification include morphological description, physical-chemical authentication, spectral and chromatographic analyses, etc. Thin layer chromatography (TLC), as one of the most conventional chromatographic techniques, has been used for identification of TCMs since Chinese Pharmacopoeia 1985 edition. Not only chemical reference substance (CRS), but also authenticated crude drug or "reference crude drug" has been introduced to some selected Chinese crude drugs and patent medicines (formulated preparations) in TLC identification for enhancing its specificity since Chinese Pharmacopoeia 1990 edition. With this application, TLC identification can be conducted by comparing the whole image of a chromatogram of the "reference crude drug" to the sample tested. As one of the series reference books of Chinese Pharmacopoeia 1990 edition, *Colour Atlas of Thin-Layer Chromatography Identification for TCM of Pharmacopoeia of P.R. China 1990 Edition* was published (Editor-in-chief: XIE Pei-shan; 1993). This book introduced the general operational procedure and described the key steps on how to optimize the TLC condition based on the author's experiences and by referring to a classical TLC book, *Fundamentals of Thin-Layer Chromatography* (*Planar Chromatography*) (Friedrich Geiss; 1987) in Chapter 1. And the examples of the TLC experiments together with coloured images of selected Chinese crude drugs were included in the successive chapters. The possibility of reproducible TLC identification with a better resolution by using home-made silica gel plate with total manual operations were demonstrated in this book, which has served as a guidance for TLC identification of TCMs.

However, further developments in TLC have been slowed down and limited by sole reliance upon manual operations and home-made TLC plates. The technique is reduced as inferior by comparison with other more advanced instrumentation with computer-automated or semi-automatic devices. Since the 1990s, the pharmacopoeias of western countries have endorsed the use of commercially available silica gel TLC/HPTLC pre-coated plates for improved repeatability and reproducibility of TLC identification. To keep pace with the global trends, the Chinese Pharmacopoeia Commission has suggested the use of commercially available pre-coated TLC/HPTLC plates as far as possible. The goals in the publication of this new atlas of TLC for Chinese crude drugs (as one of the series books affiliated with current edition of Chinese Pharmacopoeia) are to maintain the advantage of TLC identification as a credible standard in ensuring effective quality and control of Chinese medicines. However, it is understood that the chromatographic condition optimization is a continual, unending process with even the current edition requiring update. For example, benzene was a very commonly used solvent for the mobile phase for its high performance in separation but still has to be replaced by other solvents when considering about its significant toxicity. On the other hand, other obvious low-performance solvents have also been revised or replaced. As expected, all future modification or revision will be included in supplemental updates if necessary. In this atlas, there are renewed guidelines on the TLC plate activation,