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Herbal Drugs, Herbal Drug Preparations, and Herbal Medicinal Products

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I. INTRODUCTION

Identification of medicinal plants is one of the oldest fields for the application of thin-layer chromatography (TLC). In the early 1950s, Kirchner et al. (1) used TLC for the analysis of herbal drugs and published many papers. Stahl standardized the methods of TLC by publishing his famous laboratory handbook in 1962 (2). This led to official recognition of TLC and its acceptance as an analytical tool. In the case of identification of herbal drugs by TLC, acceptance was very progressive and led to the publication of numerous methods that are still included in pharmacopoeias worldwide. However, with few exceptions, none of the official methods represents TLC as it is practiced today.

The past few years have seen tremendous growth in the use of herbal medicines worldwide. New products enter the market almost daily, and the demand for analytical methods to ensure safety and quality is rapidly increasing. A new methodology is necessary!

This chapter presents what modern instrumental high-performance thin-layer chromatography (HPTLC) has to offer for the analysis of herbals. Based on our experience with training courses, seminars, and workshops for analysts in the field as well as many discussions with specialists from industry, academia, and regulatory bodies, we propose herein solutions for today's problems and provide guidance for efficient use of HPTLC wherever it is applicable as part of the analytical toolbox. We appreciate the fact that there is more than one way to reach an analytical goal, particularly if a method offers the flexibility of planar chromatography. However, standardization can offer reliability and transferability, features that are important in laboratories that have to comply with good manufacturing and laboratory practice (GMP/GLP). Therefore, the chapter focuses on standardized methodology. The chapter is written primarily for novices who want to use HPTLC for herbal analysis, but we also hope that experienced professionals will find some points of interest to consider for their future work.

A. Scope

Interest in research concerning the constituents and biological activities of medicinal plants has significantly increased in recent years. Clinical studies have provided evidence that there is a great potential for herbal medicinal products. St. John's wort (3), ginkgo (4), and saw palmetto (5) can serve as good examples. The United States and European Pharmacopoeias are continuously revising their monographs on medicinal plants and have begun to include monographs for herbal extracts. Ten monographs including TLC identification are part of the National Formulary 19 (6) (Table 1). The 2001 edition of the European Pharmacopoeia (7) contains 173 monographs on drugs, including essential oils, gums, and resins, and six monographs on extracts. In 2001, Pharmeuropa (8) published 14 monographs on drugs and six on extracts for review and discussion. All but one