

[Pharmacognosy] has been employed throughout the course of man's life on earth—by primitive hunters and warriors who selected specific plants for preparing spear and arrow poisons; by priest-physicians and herbalists who learned by trial and error that some plants produced and others dispelled the symptoms of disease; by apothecaries and chemists who prepared more potent and stable products from crude materials.

Pratt and Youngken, *Pharmacognosy*, 1956

“Pharmacognosy’!—What’s That? You Spell It How?”

This heading was the title of a 1996 *Economic Botany* article by noted pharmacognosist Varro “Tip” Tyler (1926–2001) and underscored the identity crisis of a scientific profession that is undoubtedly linked to one of the oldest professions on Earth—herbal medicine. Rooted in medicine, pharmacognosy developed as a distinct discipline due to the need for a specialized field of knowledge that was markedly separate from the practice of medicine (physicians), the dispensing of medicines (pharmacy), materia medica (pharmacology), and the identification of medicinal plants (botany). Pharmacognosy emerged as an amalgamation of these latter three and thus evolved as a general discipline.

This generalist nature both reflected pharmacognosy’s uniqueness and caused its relative downfall under the pressures of mining for modern pharmaceuticals and the simultaneous decrease in use of herbal medicine. Botanical microscopy, a very unique aspect of pharmacognosy, was a prevalent focus of pharmacognosy at a time when the evolution of medicine was moving away from the physical and into the chemical. Thus, in order to survive, pharmacognosy had to evolve into a science that encompassed the chemical and molecular realities of modern drug development. As a consequence, much of the botanical skills of early pharmacognosists were cast aside.

In recent decades, pharmacognosy has mostly been absorbed under the general heading of pharmaceutical sciences, losing its unique identity. This has spurred emotional and prolonged debate of whether the term *pharmacognosy* clearly or fully describes everything encompassed in the discipline today. For example, the American Society of Pharmacognosy (ASP) has struggled with its identity and numerous attempts have been made to discontinue the

term *pharmacognosy* in lieu of nomenclature more befitting the modern manifestation of natural products chemistry, structural elucidation, biological screening, and pharmacognosy as a molecular science. Part of this desire is to shed the perceived limitations associated with the scope of pharmacognosy in the past, much of which was an overwhelming focus on microscopy and early chemical techniques. Another motivation is funding; it is easier to obtain funding for anything molecular than for the assessment of crude drug materials.

Following is a historical overview of the development of pharmacognosy as a distinct scientific discipline in the early nineteenth century West, with a particular emphasis on the role played by microscopy in defining pharmacognosy as a discrete field within the larger sphere of pharmaceutical sciences (Table 1.1). It must also be noted that classical botanical pharmacognosy is very much alive and well in other parts of the world, most notably in Asia and the Middle East. This is in part due to a higher level of societal integration of botanical medicines, which to some extent is driven by the relative low cost of botanical versus conventional medicines, and in part to the lack of the relatively expensive instrumentation needed for sophisticated analysis.

Pharmacognosy—Knowledge of Medicines

In the early 1800s, Johann Adam Schmidt (1759–1809; Figure 1.1a), a professor of general pathology, therapeutics, and materia medica at the Joseph Academy of Medicine in Vienna, Austria, penned a handwritten manuscript entitled *Lehrbuch der Materia Medica*, which was posthumously published in 1811. In his *Lehrbuch*, Schmidt, a physician of Beethoven’s, for the first time in published literature used the term *pharmacognosis* (Figure 1.1b), from the Greek *pharmakon* (*Pharmakon*), meaning medicine or poison, and *gnosis* (*gnōσις*), meaning knowledge. This described the skills necessary for the development of medicines, from source to finished medical products and their uses. Until this time, these skills were taught under the general heading of “materia medica.”

A few years later, in 1815, a medical student in Halle an der Saale, Germany, named Christianus Aenotheus Seydler used the term *pharmacognosy* for the first time in his doctoral thesis, “*Analecta Pharmacognostica*.” This