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GRECO-ARAB AND ISLAMIC HERBAL MEDICINE

*Traditional System, Ethics,
Safety, Efficacy, and
Regulatory Issues*



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GRECO-ARAB AND ISLAMIC HERBAL MEDICINE

TRADITIONAL SYSTEM, ETHICS,
SAFETY, EFFICACY, AND
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Foreword

There was a huge enlightenment in the Arab world at a time when Europe was in the grip of the Dark Ages, stifled by Church authority. A major part of this explosion of intellectual freedom was the creation of an entirely new coherent medical system, based on the medicine of the Greeks, the Egyptians, and even of India, that developed into a rational, experimental, and thorough corpus with its theories and treatment protocols, pharmacies, hospitals, libraries, and thousands of new medicines and combinations used for the first time along with differential diagnosis. It became a foundation stone of modern medicine and also of herbal medicine in the West. And it still exists. Arabic medicine today stands alongside Ayurvedic and Chinese medicine as one of the great traditional medical systems of the world and is popularly used in all Muslim countries from Pakistan to Morocco. However, it is relatively unknown and unappreciated as a system in its own right, and today, at a time when natural medicine is a primary source of new therapies and remedies, there is still a great deal to be learnt from it.

This book sets out to reveal the potential of Arabic medicine and especially medicinal plants as a living and vital medical resource today. In this it is quite unique, especially because of its coverage of research on the herbs, and much of it was carried out in the authors' own labs. As far as I am aware, no other professional-level book covers the pharmacology and science of so many important herbs that are widely used in Arabic countries but are still relatively unknown in the West. Take, for example, *Nigella* (black seed). It is a central herb in Arabic medicine used as a powerful anti-inflammatory and antiseptic. The authors have researched this herb and there are also hundreds of

papers, including clinical studies, published on it in the world scientific literature, yet the herb is still unknown and unused in the West except as a spice. This book might well raise its profile worldwide. There has been an assumption in the past that all the herbs of Arabic medicine are already known and used in modern professional herbalism and the health industry. This is not so [1], and this book can be very helpful in introducing a host of novel plants, together with research on them.

Professor Bashar Saad and Dr. Omar Said have written what may well become a classic text on Arabic medicine, not only because of its pharmacological and scientific material, but also because of its interdisciplinary nature. It is a fascinating exploration of the richness of the past knowledge, combined with ethnopharmacology of Arabic medicine today, safety and pharmacology of Arabic medicinal plants, botany, clinical aspects, Arabic medical principles, and so on. The authors are uniquely qualified to write this book, because they themselves embody the interdisciplinary wisdom needed for it. Indeed, they would stand alongside some of the greats of ancient Arabic medicine, who transcended boundaries of subject and discipline. Many times I have walked with the authors over the Galilee hills and listened as they picked out a small hidden herb, identified it, described its Latin, Arabic, English, Hebrew, and ancient names, described its uses and the debates surrounding it in the ancient literature, told me what is in it chemically, described how it performs in the lab and how it should be formulated into a finished remedy, and told stories of, for example, of how the Bedouin of the Negev desert or the Druze of Syria might use it today. The authors are accomplished scientists in the fields of pharmacology, cell biology, and immunology and bring this unique and original aspect of modern science to the herbal wisdom. Besides, the authors are involved in the Galilee

Society's botanical garden of medicinal plants, the largest garden devoted to medicinal plants in the Middle East. Thousands of children go there every year and are taught about the traditional medicine of the region. And it should also be mentioned that working and researching on traditional Arabic medicine in Israel and Palestine, regions of conflict, has not been easy.

Today, it is acknowledged that much of modern drug discovery depends on natural product concepts. The first steps are usually the work by ethnopharmacologists in the field and pharmacologists in the lab. This book breaks new ground in opening up a forgotten resource for both drug discovery and new natural product medicines.

Stephen Fulder

Reference

1. Fulder SJ, Said O. Steps towards revival of Graeco-Arabic medicine in the Middle East: a new project. *HerbalGram* 2009; 83: 36-45.

Preface

At the beginning of the twenty-first century and despite the great progress in modern medicine, traditional Arab-Islamic medicine continues to be practiced within the Mediterranean as well as most Arab and Islamic countries. A very important factor that has enhanced the present popularity and widespread use of Arab herbal-based medicines is the belief that they are prepared according to the principles of Greco-Arab and Islamic medicine, which was developed during the Golden Age of Arab-Islamic civilization. This civilization spanned from the seventh to the fifteenth century and extended from Spain to Central Asia and India. It became a wellspring of brilliant medical developments and innovations, as well as of great achievements in astronomy, mathematics, chemistry, philosophy, and arts. Arab and Muslim scientists significantly contributed to the development of modern Western medicine, accomplishing far more than mere translation. A closer look at their activity during the medieval period shows that they translated classical medical texts not only from Greece, but also from Persia, India, and China. From this, Arab and Muslim scientists were able to synthesize and develop a rich and universal medical system based on scientific methods and experimentation. The works of Arab and Muslim scholars gained widespread use and were used in European medical schools. For instance, the Arab and Muslim physicians Al Tabbari, Rhazes, Al-Zahrawi (Albucasis), Al-Biruni, Avicenna, Ibn al-Haitham, Ibn al Nafees, Ibn Khaldun, and Ibn Zuhr (Avenzoar) are regarded as among the great medical authorities of the ancient world and the medieval world, physicians whose textbooks were used in European universities up to the sixteenth century. They were among the first to make accurate diagnoses of plague, diphtheria, diabetes, gout, cancer, leprosy, rabies, and epilepsy.

Avicenna's and Rhazes's works on infectious diseases led to the introduction of quarantine as a means of limiting the spread of these diseases. Arab physicians laid down the principles of clinical investigation and drug trials, as well as animal tests. They mastered operations for hernia and cataracts, filled teeth with gold leaf, and prescribed spectacles for defective eyesight. The physicians and scientists of the Islamic Golden Age, who were of diverse religious and ethnic backgrounds, passed on rules of health, diet, and hygiene that are still largely valid.

The high degree of development achieved in Greco-Arab and Islamic medicine is observable in a statement of Avicenna (980–1037), who defined medicine in his *Canon of Medicine* as “the science from which we learn the states of the human body with respect to what is healthy and what is not; in order to preserve good health when it exists and restore it when it is lacking.” He further stated that “we have to understand that the best and most effective remedy for the treatment of patients should be through the improvement of the power of the human body in order to increase its immune system, which is based on the beauty of the surroundings and letting him listen to the best music and allowing his best friends to be with him.” Another statement concerning therapeutic methods was made by Rhazes (846–930): “if the physician is able to treat with foodstuffs, not medication, then he has succeeded. If, however, he must use medications, then it should be simple remedies and not compound ones.” Arab-Islamic medicine influenced Western medical circles to such an extent that it was included in the curriculum of European medical schools for many centuries. It became a foundation stone of modern medicine and also of herbal medicine in the West. And it still exists. Arab-Islamic medicine today stands as one of the great traditional medical systems of the world and is

popularly used in all Arab and Islamic countries from Pakistan to Morocco.

The Eastern region of the Mediterranean is covered with at least 3600 plant species of which 700–800 are noted in medieval medical books for their use as medicinal herbs. Recent ethnopharmacological studies have demonstrated that more than 450 medicinal plants have continued to be employed in the treatment and prevention of human diseases within the Mediterranean as well as most Islamic countries. Some of these plant species have been investigated and their bioactive ingredients extracted to treat various human diseases.

This book is the first academic book in the field of Arab herbal medicine that explores and introduces aspects of Arab herbal medicine using original ethnopharmacological surveys conducted by our group in the Mediterranean area. This book includes 19 chapters, embracing particularly historical aspects and present uses of traditional Arab-Islamic herbal medicine. Chapters 1, 2, 3, 4, 5 focus on historical background, medical innovations introduced by Arab physicians, common roots of Arab medicine and Western medicine, and methodology of drug discovery and therapy in Arabic and Islamic medicine. Chapters 6, 7, 8, 9, 10 present a comprehensive review of the methodology of drug discovery, method of therapy, and commonly used herbal medicines in the Arab-Islamic world and their tremendous potential in modern drug discovery. Chapters 11, 12, 13, 14 combine overviews of state-of-the-art *in vitro* and *in vivo* techniques, as well as clinical trials of traditional herbal medicine. Chapters 15 and 16 cover medical ethics in Arabic and Islamic medicine, uses of medicinal plants, and methods of extracting their active ingredients. Chapter 17 examines the use of food therapy in Arab-Islamic medicine. Chapters 18 and 19 focus on demographic and regulatory issues, as well as on drug development from herbal sources.

For convenience, all dates given in book are those of the Christian calendar, unless otherwise specified. The designation AD is used only when there is a need to distinguish a date from an earlier BC date. General references to a century rather than to a specific year refer to centuries of the Christian era.

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Chapter 1

An Overview of Greco-Arab and Islamic Herbal Medicine

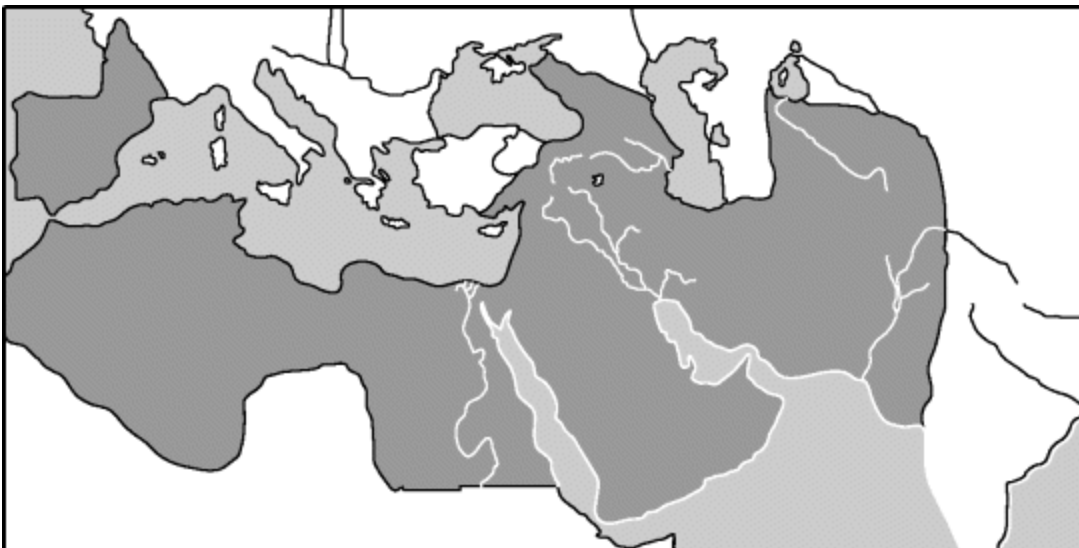
1.1 Introduction

Natural products, such as plant, fungal, and bee products, as well as minerals, shells, and certain animal products, represent the oldest form of medical treatment. Currently, many of the commonly used drugs are of herbal origin and about 25% of the prescription drugs contain at least one herbal-derived active ingredient or synthetic compound, which mimics a plant-derived compound. There are over 80,000 plants that have medicinal uses throughout the world and usually a specific part of the plant is used for medical preparations such as tablets, infusions, extracts, tinctures, ointments, or creams. The pharmacological action of these medicines is often described in very general terms, such as carminative (an agent that prevents formation of gas in the gastrointestinal tract or facilitates the expulsion of said gas), laxative (an agent that induces bowel movements or loosens the stools), demulcent (an agent that forms a soothing film over a mucous membrane, relieving minor pain and inflammation of the membrane), antitussive (cough suppressants), or antiseptic (antimicrobial substances that are applied to living tissue/skin to reduce the possibility of infection). Unlike synthetic drugs, which usually consist of a single and often synthetic chemical, herbal-based medicines contain multiple constituents.

In the history of science, Arabic medicine, Islamic medicine, Arab-Islamic medicine, Greco-Arab medicine, or

Greco-Arab and Islamic medicine are terms that refer to medicine developed during the Golden Age of Arab-Islamic civilization (seventh to fifteenth century), which extended from Spain to Central Asia and India ([Figure 1.1](#)). This civilization became the center of brilliant medical developments and innovations, as well as great achievements in astronomy, mathematics, chemistry, philosophy, and artistic culture. Arab and Muslim scholars translated and integrated scientific knowledge of other civilizations into their own. As will be seen in the following chapters, however, Arab-Islamic medicine was not simply a continuation of Greek ideas but a venue for innovation and change. These included the discovery of the immune system, the introduction of microbiological science, and the separation of pharmacological science from medicine. Medicine in general is considered to be one of the most illustrious and best known achievements of Arab-Islamic civilization, which influenced Western medical circles to such an extent that it was included in the curriculum of medical schools up to sixteenth century.

[Figure 1.1](#) The medieval Arab-Islamic Empire at its largest extension.



Despite great progress in allopathic medicine, Arab-Islamic medicine has continued to be practiced within the Mediterranean as well as most Arab and Islamic countries ([Table 10.2](#)), where cultural beliefs and religion often lead to self-care or home remedies in rural areas and consultation with traditional healers. In addition, Arab-Islamic therapies are most often utilized by people who have faith in spiritual healers and herbalists. These people are the first to be consulted for problems such as infertility, impotence, diabetes, obesity, epilepsy, psychosomatic troubles, and many other diseases (see Chapter 10). The popularity of herbal preparations based on Greco-Arab and Islamic medicines has increased worldwide in the past four decades, probably because of the sustainability of this medicine over the years. Other factors include the notion that herbal-based drugs are safe (see Chapter 13), that they are relatively inexpensive, the restricted access to physicians imposed by managed care, and the adverse effects of synthetic drugs.

Chapter 10 provides an overview of Greco-Arab and Islamic medicine practiced in countries other than those in the Middle East, such as Iran, India, Turkey, Maghreb region, and Pakistan [1–10]. India is the only country where Greco-Arab medicine has an official status. It was introduced by Arabs and soon took firm roots in the subcontinent. Greco-Arab and Islamic medicine as practiced in Muslim communities of the Indo-Pakistan subcontinent is known as Unani-Tibb. “Tibb” is an Arabic word meaning “medicine,” while “Unani” is thought to be derived from “Ionan” (meaning Greek), acknowledging the influence of early Greek medicine on Greco-Arab and Islamic medicine. A Unani physician is known as a *hakim*. However, the Unani medicine currently practiced in the Indo-Pakistan subcontinent is vastly different from its Greco-Arab roots. It benefited from the native medical system or folk medicine

in practice at the time in various parts of central and southern Asia, mainly Ayurvedic medicine and Chinese medicine.

Herbal medicines are classified in many European countries as drugs; in the United States, they are sold as dietary supplements. Unfortunately, in the Arab-Islamic world as well as in China and India, they are mostly sold over the counter without regulation. As discussed in Chapter 11, safety assessment of herbal products has often been neglected since prolonged and apparently safe use is usually considered as evident. Nevertheless, evidence of the toxicity of such products has accumulated. This is not surprising, since herbal products are complex mixtures of secondary metabolites, many of which are potentially toxic (e.g., hepatotoxic and nephrotoxic). Therefore, the widespread use and popularity of herbal-based medicines raises concerns and fears over the professionalism of practitioners and safety, quality, and efficacy of these products. In regard to safety, biomedical journals have reported serious side effects, particularly hepatotoxicity. These matters are covered extensively in Chapters 11 and 12.

The popularity of natural product-based therapies is rapidly increasing and global sales of herbal products top \$100 billion a year. In 2008, \$4.8 billion were spent in the United States and a large center of complementary and alternative medicine has been established recently at the NIH (National Institute of Health). And more recently, the NIH has sponsored large clinical trials of botanicals such as St. John's Wort and Ginkgo.

In the course of the following chapters, we intend to reveal the complexities, encourage comparisons, and offer answers to questions such as the following: How did Arab-Islamic medicine reach such high levels of knowledge and practice? How did Arab-Islamic scholars lay the foundations of

modern Western medicine and pharmacology? How did Arab and Muslim physicians discover and successfully treat diseases? How did Arab and Muslim scholars lay the foundation for clinical trials and animal testing? And finally we give an overview of currently used medicinal plants in the Arab world and their efficacy and safety. This book is organized around 19 major topics, reflected by the titles of these chapters: (1) An overview of Greco-Arab and Islamic herbal medicine, (2) History of Greco-Arab and Islamic medicine, (3) Herbal medicine, (4) The Arab-Islamic roots of Western medicine, (5) Contributions of Arab and Islamic scholars to modern pharmacology, (6) Natural drugs in Greco-Arab and Islamic medicine, (7) Method of therapy in Greco-Arab and Islamic medicine, (8) Commonly used herbal medicines in the Mediterranean, (9) The current state of knowledge of Arab herbal medicine, (10) Greco-Arab and Islamic medicine practiced outside the Middle East, (11) Biosafety of herbal medicine, (12) Arab medicinal plants: from traditional uses to scientific knowledge, (13) Modern *in vitro* test systems, (14) Modern *in vivo* evaluations and clinical trials, (15) Medical ethics in Arab and Islamic medicine, (16) Medicinal herbs and extracting their active ingredients, (17) Food therapy, (18) Drug development from herbal sources, and (19) Herbal remedies: use and demographic and regulatory issues. In this introductory chapter, we will give a brief overview of the main topics of this book.

1.2 The Golden Age of Arab-Islamic Civilization

The development of Arab-Islamic civilization started in the Arabian Peninsula, the homeland of the Arabs. The Peninsula is predominantly deserted and the tribes who inhabited this area were nomadic, that is, they traveled

from one grazing land to another. The great unifying power of these nomadic Arabs was clearly the Prophet Mohammad (peace be upon him) (570–632) from the Quraysh tribe that ruled Mecca. Though Mecca was a prosperous caravan city, it was still tied to traditional social customs and was governed by the tribal societies of the desert. Each tribe worshipped its own gods in the form of objects from nature but all Arabs worshipped one object in common, the *Kaaba*, a large black stone at Mecca, which made Mecca significant as a place of worship and pilgrimage. The Prophet was able to unite the nomadic tribes and to create a strong nation, able to defeat the two powerful empires at that time, the Persian and Byzantine Empires.

The Byzantines and Persians were the first to feel the power of unified Arabs. At Yarmuk in 636, the Arabs defeated the Byzantine army ([Table 1.1](#)). Syria fell in 640. A decade later, the Arabs had conquered the entire Persian Empire. Egypt, the Maghreb (North Africa), and Spain were all conquered and under Arab rule by the 720s. Arab expansion in Europe ended after the loss of the Battle of Tours in 732. The Arabs not only conquered new lands, but also became scientific innovators through originality and productivity. They preserved the cultures and knowledge of the conquered lands, tolerated religious minorities within land they had conquered, and were careful to protect the purity of their religion, language, and law from any foreign influence.

[Table 1.1](#) Timeline of Arab Islamic Civilization.

Year	Historical Event
570	The Prophet Mohammad is born in Mecca
622	The Prophet and followers emigrate to Medina. The first year of Islamic calendar
632	Death of the Prophet
632	Muslim armies consolidate their power over Arabia
634–644	Muslim forces advance through the Persian and Byzantine empires