



Greco-Arab and Islamic Herbal Medicine: A Review

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Author's contribution

The author, Bashar saad, wrote this review article and approved the final manuscript.

Review Article

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ABSTRACT

Traditional Greco-Arab and Islamic medicine continues to be practiced within the Mediterranean as well as most Islamic countries. This medicine was developed during the Golden Age of Arab-Islamic civilization, which spanned from the seventh to fifteenth century and extended from Spain to Central Asia and India. During the Islamic Golden Age, there was a huge enlightenment in the Arab-Islamic world at a time when Europe was in the grip of the Dark Ages, stifled by Church authority. Greco-Arab and Islamic medicine has influenced the fates and fortunes of countless human beings. It also influenced Europe where it formed the roots from which modern Western medicine arose. There is no doubt that the earlier Greco-Roman scholarly medical literature was the stem from which much Arab-Islamic medicine grew, just as, several centuries later, Arab-Islamic medicine was to be the core of late middle ages and early European medical education. As will be seen in this review, however, Arab-Islamic medicine was not simply a continuation for Greek ideas but it was a venue for innovation and change. Medical innovations introduced by Arab and Muslim physicians included: The discovering of the immune system, the introduction of microbiological science, and the separation of pharmacological science from medicine. The high degree of development achieved in Greco-Arab and Islamic medicine is observable in a statement of Rhazes who said: "*when the disease is stronger than the natural resistance of the patient, medicine is of no use. When the patient's resistance is stronger than the disease, the physician is of no use. When the disease and the patient's resistance are equally balanced, the physician is needed to help tilt the balance in the patients favour*". This article provides a

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comprehensive overview on traditional Greco-Arab-Islamic herbal medicine including the historical background, medical innovations introduced by Arab physicians, methods of therapies, and a state of the art description of traditional Arab herbal medicine.

Keywords: Arab-Islamic herbal medicine; methods of therapies; Avicenna; Rhazes.

1. INTRODUCTION

Currently, the characterization of the pharmacological and biological effects of herbal-based medicines is becoming more competitive and complex, with the involvement in this research area of experts belonging to different scientific fields, including botany, chemistry, biochemistry, immunology, molecular biology, and bioinformatics. These fields are becoming of great interest for several high-impact scientific journals. In parallel, herbalists and spiritual healers continue to be the first choice for health care problems such as diabetes, obesity, infertility, impotence, skin diseases, psychosomatic troubles, and many other diseases. In Greco-Arab and Islamic Medicine all components of existence are treated with equal importance, from breath and body to the soul and matter; both spiritual and physical health are essential. As a result, many Arab and Muslim physicians proposed that the body should be treated as a whole and not just as a series of organs, and that it was endowed with an ability of natural healing, which depended on rest, a good diet, fresh air and cleanliness. They noted that there were individual differences in the severity of disease symptoms, and in the individual ability to cope with disease and healing. Hippocrates thus laid the foundations of the modern theory that thoughts, ideas and feelings, which he proposed to originate in the brain, can influence health and the process of disease. Rhazes supported this concept by his recommendation: *"The physician, even though he has his doubts, must always make the patient believe that he will recover, for state of the body is linked to the state of the mind."* Later on, Avicenna who defined 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"* supported the views of Rhazes. He 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"*.

It is now clear that the mind and the body interact, influence and regulate each other. Recent research has indicated that the perception of stress can lead to production of 'stress hormones', as well as products of the immune system. These 'stress hormones' act in a feedback mechanism to regulate their own production and the production of certain immune products. These immune products act on the brain to modify behavior and the ability to perceive and to respond to stressful challenges by inducing lethargy, fever and nausea (i.e. 'sickness behavior').

Based on recommendations of Rhazes and Avicenna, Greco-Arab and Islamic medicine treated patients through a scheme starting with physiotherapy and diet; if this failed, drugs were used. Rhazes's treatment scheme started with diet therapy, he noted that *"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."* Drugs were divided into two groups, simple and compound drugs. Physicians were aware of the interaction between drugs, thus, they used simple drugs first. If these failed,

compound drugs, consisting of two or more compounds were used. If these conservative measures failed, surgery was undertaken [1-8].

1.1 A Brief History of Arab Medicine

The modern use of Arab-Islamic herbal medicines has historical roots in Greco-Arab and Islamic medicine, which was developed in the golden age (seventh to fifteenth century) of the Islamic civilization. Arab-Islamic medicine finds a widespread use in most Arab and Islamic countries that build about one fifth of the world's population. The Arab and Muslim world refers in geopolitical sense to Muslim majority countries or countries in which Islam dominates politically. 25% of Muslims live in the Indian subcontinent; 20% in sub-Saharan Africa; 17% in South East Asia; 18% in the Arab world; 10% in the republics of the old Soviet Union and China; and Turkey, Iran and Afghanistan comprise 10% of the non-Arab Middle East. Arab-Islamic community is spread across many different nations and ethnic groups connected only by religion. Medicine in general is considered to be one of the most illustrious and best known facets of Arab-Islamic civilization in which Arabs most excelled. It became influential in Western medical circles to such an extent that it was included in the curriculum of medical schools for many centuries. In the history of medicine, Islamic medicine, Arabic medicine, or Greco-Arab and Islamic medicine refers to medicine developed in the golden age of the Islamic civilization and written in Arabic, the lingua franca of the Islamic civilization [1-4].

The history of Arab medicine can be divided into three stages: Greek into Arab, Arab, and Arab into Latin. The first phase "Greek into Arab" started in the eighth century (A.C) when Islam covered nearly two-thirds of the known world. This was the period of translation of Greek scientific and philosophical manuscripts into Arabic. The Khalifs in Baghdad became aware of what was to be learned from Greek science, and in the reign of *al-Ma'mun* an institution was founded for this purpose, "The House of Wisdom". The most famous of all the translators was *Hunayn Ibn-Is'haq*. He and his team translated a large number of medical manuscripts by Hippocrates and Galen, philosophical works by Plato and Aristotle, and mathematical works by Euclid and Archimedes. Hospitals and medical schools flourished during that period, first in Baghdad and later in the main provincial cities [6-12].

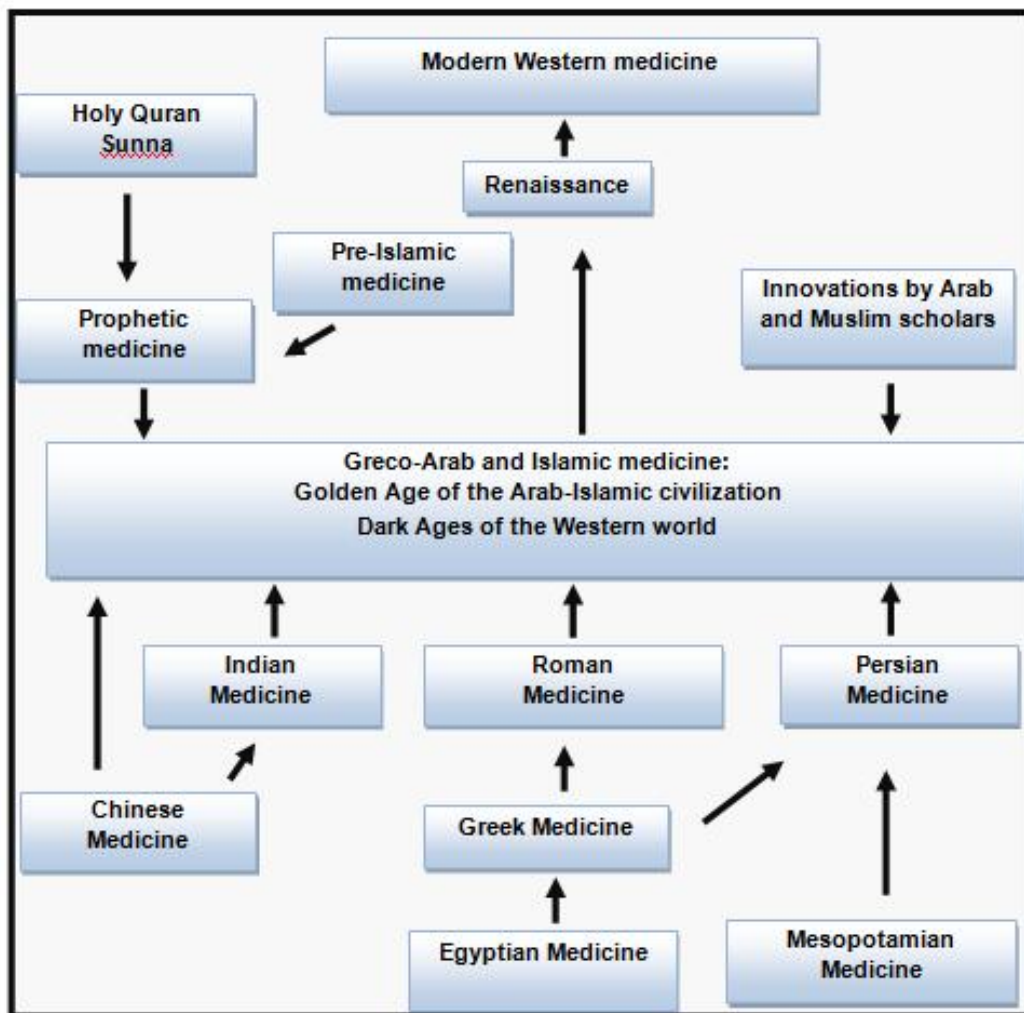


Fig.1. Development of Greco-Arab and Islamic medicine

After the first period of translation, when the chief works of Galen and Hippocrates were made available in Arabic. Christians lost their monopoly of medicine, and several Muslims reached such a stature in medical science that they stood far above their immediate predecessors and were roughly on a level with the greatest of the Greeks. Some notable scholars of the science of Arab medicine were: *Al Tabbari* (838-870), *Al Razi* (Rhazes) (846-930), *Al Zahrawi* (930-1013), *Avicenna* (980-1037), *Ibn Al Haitham* (960-1040), *Ibn Al Nafees* (1213-1288), and *Ibn Khaldun* (1332-1395).

The third phase "Arab into Latin" began in the twelfth century when European scholars who were interested in science and philosophy came to appreciate how much they needed to learn from the Arabs. As such, they set about studying Arab manuscripts in these disciplines and translating the most important ones into Latin. The most outstanding writer on medicine in Arabic was Ibn-Sina, or as he was known in the West, Avicenna. Like Al Razi, Ibn-Sina wrote on many subjects, and was known to have been a greater philosopher than a

physician. Nevertheless, his vast "Canon of Medicine" is rightly acclaimed as the "culmination and masterpiece of Arab systematization." It was translated into Latin in the twelfth century, and continued to dominate the teaching of medicine in Europe until at least the end of the sixteenth century. There were sixteen editions of Ibn Sina's work in the fifteenth century, twenty editions in the sixteenth century, and several more in the seventeenth century. His book classifies and describes diseases, and outlines their assumed causes. It also discusses hygiene, simple and complex medicines, the symptoms and complications of diabetes, and functions of parts of the body. Ibn Sina even asserted that tuberculosis was contagious, which was later disputed by Europeans, but turned out to be true [1-6].

1.2 Innovations Introduced by Arab Physicians

Medical innovations introduced by Arab and Muslim physicians included: The discovering of the immune system and the introduction of microbiological science. Furthermore, Avicenna was the first to use ice to treat fever diseases and separate medicine from pharmacological science. Arab physicians introduced the use of animal testing and combined different sciences such as chemistry, medicine, pharmacology, agriculture, and plant science in order to develop new treatments for their patients. In surgery, Al Zahrawi was the first to develop various surgical equipments and tools, some of which were unique for surgery on females. Later on, Ibn Al Haitham improved the surgery of eyes and studied the process of sight for the first time. Arab doctors were also aware of the contagious qualities of diseases [1-6].

Hundreds of medical works were translated into Latin. Every major city had a hospital, the hospital at Cairo had separate wards for fevers, ophthalmic, dysentery and surgical cases. Concerning herbal medicine, Arab physicians introduced many new ideas and upgraded the knowledge about herbs and their potential medical efficacy and safety. For example, Al-Rhazes discovered the origin of smallpox and showed that one could only acquire it once in one's life; thus, showing the existence and workings of the immune system. Jaber Ibn Hayan and others extracted different anesthetic compounds from local herbs for local or general anesthetization. Daoud Al-Antaki, used different herbs for treating patients and published a book on medicinal herbs summarizing the knowledge of his predecessors. Ibn Al-Bitar, in Andalusia, Spain, introduced around 350 new plant species as medicinal herbs for treating human diseases. Abu Al-Abbas and other herbalists published several books and dictionaries on the use of medicinal plants describing each plant species, the plant parts used, the preparation procedure used for each remedy, and the treatment procedure of certain diseases. Avicenna (980-1037) published several books such as "Alkanoon Fi Altib" (Canon of Medicine) in addition to Rhazes book "AlHawy" (The comprehensive), which were translated into several different languages (Rhazes, 925; Avicenna, 1037). Up until a few centuries ago, these two books were the primary medicinal literature, and they are still in use in different libraries in Europe [7-13].

Eighth-century Arabs in the Baghdad region were the first to separate medicine from pharmacological science (Fig. 2). At that point, patients started to deal with experts in the pharmaceutical sciences working on the extraction and preparation of remedies, and not with physicians who were now responsible for the diagnosis of diseases and follow-up with the applied treatments. This fact resulted in a huge development in pharmaceutical science; pharmacologists and ethno pharmacologists started to search for different ingredients and extracts to be used as remedies, and they even started to study the chemical properties of the materials used in the treatment of various diseases and ailments. For the first time,

chemists such as Jaber Bin Hayan started to search for methods to extract and purify different compounds including alcohol, nitric acids, sulfuric acids, and royal acid. The latter was used to dissolve gold. In the tenth century, the well-known physician Abu Bakr Rhazes (846-930 a.c) started to use animals in the laboratory in order to test the safety and efficacy of the extracted active ingredients. The first animal used in these experiments to test the effects of mercury on the body was a monkey [7-13].

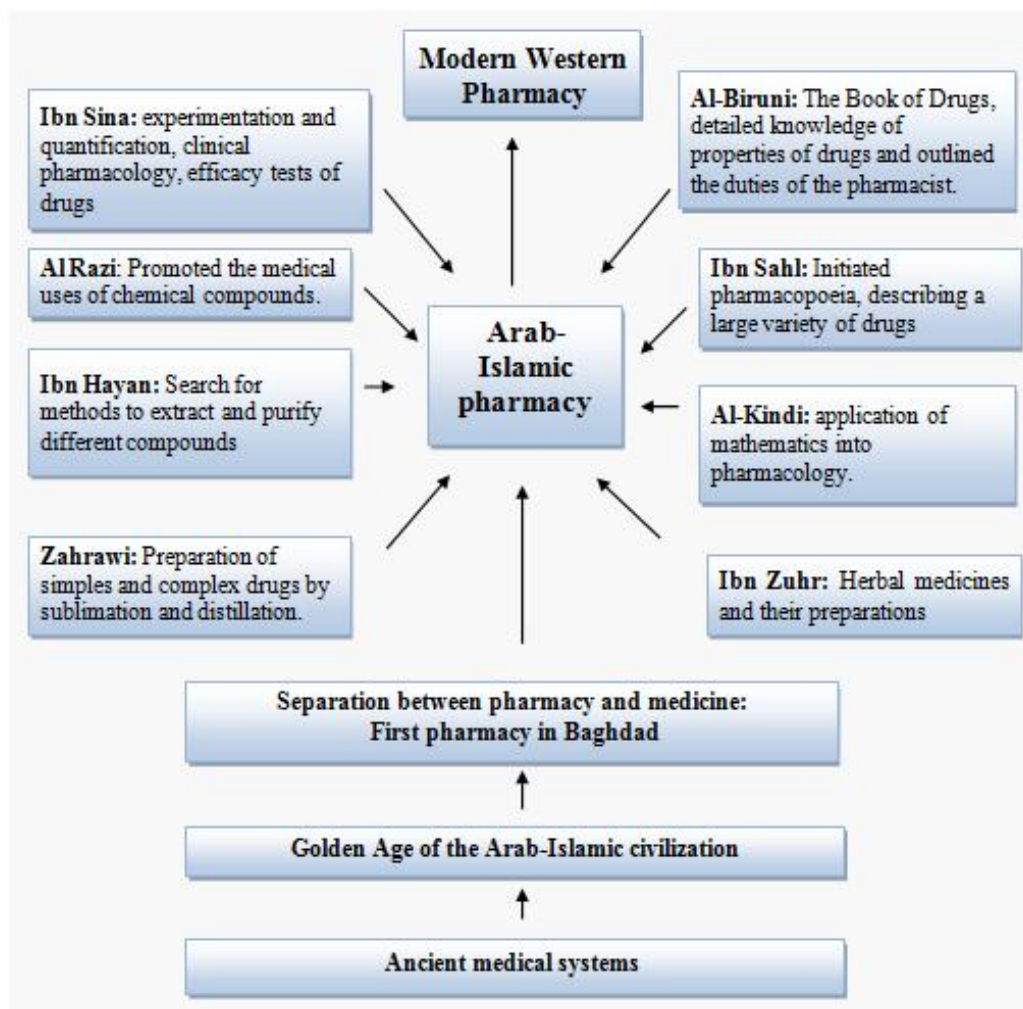


Fig. 2. Development of Arab-Islamic pharmacy and modern pharmacy

Chemists such as Jaber Bin Hayan started to search for methods to extract and purify different compounds. Avicenna devoted a whole volume to simple drugs in Canon. He described about 700 preparations, their properties, mode of action and their indications. Rhazes promoted the medical uses of chemical compounds. Al-Zahrawi (Abulcasis) described a large number of recipes and explained how to prepare the simple drugs as well as complex drugs. Shapur ibn Sahl, was, however, the first physician to initiate pharmacopoeia, describing a large variety of drugs and remedies for ailments. Al-Biruni gave in his Saydanah fit-Tib detailed knowledge of the properties of drugs and outlined the role of

pharmacy and the functions and duties of the pharmacist. Al-Kindi introduced the application of mathematics into medicine, particularly in the field of pharmacology.

1.3 Current Status of Greco-Arab and Islamic Herbal Medicine

In the Middle Eastern region, there are more than 2,600 known plant species; about 350-450 of them are still in use for treatment and prevention of diseases. The number and types medicinal plants that are currently used by herbalists and practitioners were studied in a comprehensive survey that was conducted on practitioners and herbalists using medicinal plants in an area that included Israel, the West Bank, and the Golan Heights. Results indicate that about 129 plant species are still in use in the treatment of various human diseases, including, cancer, skin, respiratory, digestive, diabetes, liver diseases, and other diseases. Plant parts used included leaves, flowers, stems, roots, seeds, and berries. Another recently published ethno pharmacological survey conducted in Jordan reached similar conclusion. They interviewed more than 100 herbalists. These herbalists revealed that there are around 150 plant herbs still in use as traditional substances. This survey indicated that almost all of the herbalists were not educated or trained in the field of herbal medicine, except for expertise gained from their predecessors. None of the herbalists were licensed for this particular purpose, and even several strange or unprecedented recommendations were presented to customers. This survey concluded that there is a necessity for proper handling and licensing of herbal medicines [10-20].

The fact that many pharmaceuticals used today were originally derived from plant sources (eg, salicylates from willow bark, quinine from cinchona, digitalis from foxglove leaves) suggests that some herbs may prove to be effective remedies for treating diseases. Nowadays, it is well accepted that there is no such thing as an "alternative" medicine, but only that for which effectiveness has been confirmed using the scrutiny of evidence-based science. The scientific criteria for causal associations include biological plausibility, consistency of research results, dose-response effects, reproducibility of the research in different contexts using different methodologies, the strength of the association, and a correct temporality between cause and effect. In the following, we will discuss the efficacy of herbal remedies in the treatment of various diseases that are prepared according to knowledge of Greco-Arab and Islamic herbal medicine.

2. CONCLUDING REMARKS

There is no doubt that during the Islamic Golden Age, there were countless achievements in medicine, and many other natural sciences. As aforementioned, Greco-Arab and Islamic herbal medicine has influenced Europe where it formed the roots from which modern Western medicine arose in late middle ages and early European medical education. It important to highlight that the Greco-Arab and Islamic medicine was not simply a translations and continuation for Greek ideas but it was a venue for innovation and change.

Currently, the characterization of the pharmacological and biological effects of herbal-based medicines is becoming more competitive and complex, with the involvement in this research area of experts belonging to different scientific fields, including botany, chemistry, biochemistry, immunology, molecular biology, and bioinformatics. These fields are becoming of great interest for several high-impact scientific journals. In parallel, Ethno pharmacological surveys from the Mediterranean as well as from other regions of the world emphasize the necessity for the proper handling and licensing of herbal medicines. The increasing

popularity of herbal-based medicinal products or other natural sources indicates that the public is not satisfied with modern medical treatment. It is necessary that not only new synthetic drugs, but also herbal remedies must fulfill international requirements on quality, safety and efficacy. As we have seen in our survey, all those surveyed would like to see more research activities in the field of medicinal plants in order to insure the quality, safety and efficacy of herbal-based remedies [21].

Although, many herbal-based medicines are safe and effective, there are many caveats concerning their use, especially in view of the recent rise in the sale and administration of herbal medicine by non-experienced herbalists. Several surveys showed that, due to a lack in proper education, herbal medicines are prescribed by traditional healers symptomatically rather than as a result of a full and holistic determination of the underlying disease.

It is well known that plants (e.g., medicinal plants) contain many substances. Both, activity and concentration of these compounds are subject to change due to changing conditions of the environment, especially storage. If not properly stored, the pharmaceutically active compounds in plants could degrade by hydrolysis or oxidation, and could be transformed into rather toxic compounds or degradation products. In certain simple to mild diseases, herbal medicine could be useful, independent of diagnosis, but this is unlikely in the majority of cases which require a complex history of the patient, a thorough physical examination and proper laboratory data for the correct diagnosis and adequate treatment. Also, many cultivated medicinal herbs went through different breeding procedures throughout the years with the aim of increasing their yield. Presumably, the newly cultivated and hybridized strains of the same species may not correspond to the plants described in the old books. Despite potentially harmful information, herbalists in the Arab world rely on these books which could be the source of differences among the documented and recommended uses of commonly used medicinal plants. Such books often did not provide clear descriptions of preparation methods accompanying the herbalists' recommendations. Such findings support the necessity of regulations concerning the proper handling of herbal medicines, which requires proper oversight and licensing. WHO regulations can be considered a good basis for such regulations.

Medicinal plants in the Mediterranean are becoming increasingly rare, due to the ongoing destruction of their natural habitat, over-harvesting of wild species, and detrimental climatic and environmental changes. This gives an added sense of urgency to the task of recording their identity and use, as well as initiating programs of preservation of the genetic resources of medicinal plants of the region. This is especially relevant due to the growing interest in herbal medicines globally, accompanied by increased laboratory investigation into the pharmacological properties of the bioactive ingredients used to treat various diseases.

CONSENT

Not applicable.

ETHICAL APPROVAL

Not applicable.

COMPETING INTERESTS

Author has declared that no competing interests exist.

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