

CONTRIBUTIONS OF ANDALUSIAN MUSLIMS TO THE FIELD OF MEDICINE THROUGH THEIR MEDICAL TREATISES: A STUDY OF SELECTED MODELS



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Abstract:

Andalusia served as the civilizational bridge that transmitted the lights of Islamic knowledge to an Europe then submerged in ignorance. Although the initial focus was on the traditional sciences, the reign of Caliph Abd al-Rahman al-Nasir marked a pivotal shift toward the rational sciences by the 4th century AH (10th century CE). Cordoba flourished as a global center for medicine, particularly in the field of surgery—an area revolutionized by Andalusian scholars. This progress was propelled by the active encouragement of the Umayyad rulers and the vitality of scientific travels. This research aims to highlight the contributions of Andalusia's preeminent physicians, whose reference works formulated the foundations of medicine in both the Islamic world and Europe throughout the Middle Ages and the Renaissance.

key words: Medicine Andalusia; Umayyad Rulers; Rational Sciences; Medical Treatises; Scientific Travel

Introduction:

Andalusian civilization stands as a manifestation of a refined lifestyle and an earnest endeavor to innovate the ideal model of human existence. While historians often describe Europe as languishing in the depths of ignorance and darkness during that era, they except Islamic Spain (al-Andalus)—the destination of sophistication and urbanization,

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and the pinnacle of human intellectual development at the time. Although scientific life during its first three centuries was characterized by the confinement of research and intellectual production to the transmitted science, the efforts of the Umayyad Caliphs, beginning with Caliph Abd al-Rahman al-Nasir, paved the way for Andalusians to engage in the field of rational sciences.

The capital of the Umayyad Caliphs, Cordoba, witnessed significant progress in the field of medical sciences, reaching its zenith through the emergence of prominent Muslim physicians. These scholars left behind treatises that benefited and influenced European nations during the Middle Ages and the Renaissance, particularly regarding surgical procedures, as Andalusian Muslims are considered the first to have practiced them. As a contribution to this international scientific symposium dedicated to "Muslim Communities and Their Role in the Development of Society," we have chosen to highlight the most famous physicians whose reputations spread globally and who left behind works that benefited both the Islamic and European worlds. Among these models, we mention:

1. The Arrangement of Medical Knowledge for One Who is Unable to Compile [a Manual for Himself]):

Abu al-Qasim Khalaf ibn Abbas al-Zahrawi¹ (325–404 AH / 936–1013 AD). Known as al-Qurtubi, he was raised in Cordoba and studied medicine under its most distinguished scholars. He became one of the leading physicians of an era characterized by surgical advancement, eventually being regarded as the greatest Arab surgeon in al-Andalus². Al-Humaydi described him, stating: "He was among the people of merit, piety, and knowledge; his expertise excelled in the science of medicine, in which he authored a famous book of great benefit, devoid of superfluity, titled *Al-Tasrif li-man Ajaza 'an al-Ta'lif*... No more comprehensive work on medicine, combining theory and practice, has been written"³. Ibn Abi Usaybi'a also described him, saying: "He was a virtuous physician, expert in simple and compound medicines, excellent in treatment, and had famous compositions in the medical craft, the best of which is his large book known as *al-Zahrawi*"⁴. Al-Zahrawi attained high prestige within Andalusian society and surpassed his peers; he was the first to establish surgery as a distinct branch of medical science and excelled in simple and compound pharmacology. Consequently, the Umayyad Caliph al-Hakam al-Mustansir Billah (350–366 AH / 961–976

AD) appointed him as his private physician⁵. Al-Zahrawi specialized in authoring *Al-Tasrif*, in which he deposited his personal experiences and expertise in medical and surgical practice. It is one of the most prolific books in terms of specialized scientific medical material, written over a span of fifty years. His medical encyclopedia consists of thirty treatises, the last of which he dedicated to surgery. The first chapter addressed cauterization by fire and by medicinal agents from the crown of the human head to the feet, including illustrations of cautery instruments.

2. The Arrangement of Medical Knowledge for One Who is Unable to Compile:

By Abu al-Qasim Khalaf ibn Abbas al-Zahrawi⁶ (325–404 AH / 936–1013 AD). Known as al-Qurtubi, he was raised in Cordoba and studied medicine under its most distinguished scholars. He became one of the leading physicians of an era characterized by surgical advancement, eventually being regarded as the greatest Arab surgeon in al-Andalus⁷. Al-Humaydi described him, stating: "He was among the people of merit, piety, and knowledge; his expertise excelled in the science of medicine, in which he authored a famous book of great benefit, devoid of superfluity, titled *Al-Tasrif li-man Ajaza 'an al-Ta'lif*... No more comprehensive work on medicine, combining theory and practice, has been written"⁸. Ibn Abi Usaybi'a also described him, saying: "He was a virtuous physician, expert in simple and compound medicines, excellent in treatment, and had famous compositions in the medical craft, the best of which is his large book known as *al-Zahrawi*"⁹. Al-Zahrawi attained high prestige within Andalusian society and surpassed his peers; he was the first to establish surgery as a distinct branch of medical science and excelled in simple and compound pharmacology. Consequently, the Umayyad Caliph al-Hakam al-Mustansir Billah (350–366 AH / 961–976 AD) appointed him as his private physician¹⁰. Al-Zahrawi specialized in authoring *Al-Tasrif*, in which he deposited his personal experiences and expertise in medical and surgical practice. It is one of the most prolific books in terms of specialized scientific medical material, written over a span of fifty years. His medical encyclopedia consists of thirty treatises, the last of which he dedicated to surgery. The first chapter addressed cauterization by fire and cauterization by medicine, covering the human body from head to toe, along with illustrations of iron cauterization instruments. The second chapter focused on incision, lancing, bloodletting, cupping, general surgery, and the extraction of arrows. The

third chapter was dedicated to bone setting, reduction of dislocations, and the treatment of fractures; it was categorized and organized from head to toe and included illustrations of its surgical instruments¹¹.

Al-Zahrawi is rightfully considered the first among the Arabs to excel in surgery, performing operations and utilizing specialized instruments. His book contains detailed descriptions of surgical procedures and the tools employed in them. Both Eastern physicians and the European West were influenced by his views and methods; consequently, he was regarded as a foundational school of thought that Europe emulated in Andalusian surgical medicine. His work remained the primary authority in the art of surgery until the sixteenth century¹².

He was the first to innovate new procedures in oral and dental surgery, working on dental implants, orthodontics, and replacing lost teeth with artificial ones he manufactured himself. Furthermore, he was the first to describe referred pain—the transfer of pain from a diseased tooth to a healthy one. He was also the pioneer in ligating arteries to prevent hemorrhaging and the first to recommend elevating the pelvis and legs before surgical operations on the lower half of the human body, preceding the German surgeon Trendelenburg by many centuries.

Additionally, he was the first to describe the process of lithotripsy (crushing bladder stones) and treated osteomyelitis. Al-Zahrawi also employed cauterization in its correct clinical contexts and designed numerous forms of cauteries for his use. He instructed that incisions be made in healthy tissue during amputations while ensuring the removal of diseased tissue in bone infections. Moreover, he taught physicians how to perform internal wound suturing to avoid leaving visible scars, among many other contributions to the field of medicine¹³.

His book *Al-Tasrif* was translated into Latin in Venice in 1495 AD, in Strasbourg in 1532 AD, and another translation appeared in Basel in 1541 AD. It was also translated at Oxford University in 1778 AD by John Channing, into French in 1861 AD by Lucien Leclerc, and the most recent translation was by the Orientalist Spink in 1973 AD, published by the University of California Press¹⁴.

Thanks to the brilliance of its scholars, Cordoba became a major center for the sciences, particularly in the field of medicine. Al-Andalus attained a high stature in the rational sciences, which significantly impacted its superiority and advancement over European civilization. By the testimony of Westerners themselves, the science of surgery is

indebted to the Arabs, as their books remained a primary reference for studies in medical colleges¹⁵.

His contributions were not limited to the book *al-Tasrif*; he authored works in the field of simple drugs, including "A Treatise on Simple Drugs". A manuscript copy of this work is deposited in the Egyptian National Library under No. 1071 Medicine, while the original is preserved in the British Museum Library under No. 985, titled "A Treatise on the Shelf-life of Simple and Compound Drugs." He also authored "A Book Containing the Names of Drugs in Greek, Syriac, Persian, and Romance, with an Explanation of Measures, Weights, Substitutes for Drugs, their Shelf-lives, and an Interpretation of Terms Used in Medical Books." It was written in a beautiful Andalusian script, arranged alphabetically from Alif to Ya, and was acquired by Khayr al-Din al-Zirikli, the author of *al-A'lam*¹⁶.

3. The Book of Simplification Concerning Therapeutics and Diet by Abu Marwan ibn Abd al-Malik ibn

Zuhr al-Ishbili (162 AD): –1072 AD / 557 AH – (467 AH)¹⁷

Abu Marwan ibn Abd al-Malik was raised in an environment of medicine and knowledge until he excelled in it, becoming a destination for those seeking solutions to complex medical matters from distant lands. He was fond of deeply studying the medical books authored by his father, reaching a level of extraordinary expertise. Among his noted achievements was his dedication to extracting the properties of drugs from their herbs and roots and grafting them into other roots to strengthen them. Ibn Zuhr succeeded in distinguishing between the nature of the medicine itself and the methodology of therapeutics¹⁸. He is considered one of the greatest physicians of al-Andalus; he and his family attained a prestigious status and wide fame. Ibn Zuhr's knowledge was an extension of a scientific legacy spanning two centuries. Biographical dictionaries have praised the standing of his family and their advancement in both the rational and transmitted sciences. Like his father, Ibn Zuhr became famous throughout al-Andalus, and his works were widely circulated. The scholar Ibn Rushd testified to his great skill. He also gained the appreciation of the rulers of the states he lived under, and at their direction, he authored several valuable medical works, including: *Al-Iqtisad fi Islah al-Ajsad*, *Kitab al-Tiryaq al-Saba'ini*, *Kitab al-Aghdhiya*, and his book *Al-Taysir fi al-Mudawat wa al-Tadbir*¹⁹.

The book *Al-Taysir* is considered the most famous of his medical writings and holds the highest rank in the history of medicine, as it

contains reliable medical information and facts. This work continued to be relied upon in European medical centers until the late eighteenth century AD in its Latin translation. It is noted that Ibn Zuhr authored *Al-Taysir* for the judge, scholar, and philosopher Ibn Rushd, so that it would serve as a complement to the latter's book, *Al-Kulliyat*. His book included numerous clinical patient trials, as well as Ibn Zuhr's observations in pathology and treatment methods. In doing so, he provided a genuine study of the anatomical characteristics of the human body; he offers details on the organs of the human body and the diseases that afflict them, explaining them in depth in terms of their nature, symptoms, similarities with other diseases, and the correct method of treating them through surgery, diet, or pharmacological therapy. The value of *Al-Taysir* lies in its synthesis of pathology and therapeutics, as well as his documentation of cases he personally examined and those treated by his grandfather and father. Consequently, he provided a clear picture of the health situation in al-Andalus, particularly during the Almoravid and Almohad historical periods²⁰.

4. Colliget (Al-Kulliyat fi al-Tibb by Ibn Rushd(d. ²¹) 595 AH / 1198 AD):

In Al-Kulliyat, Ibn Rushd addressed the principles of medical science, critiquing and discussing the views of his predecessors on many theories. He followed a methodology centered on the necessity of preserving health and treating disease through a comprehensive understanding of anatomy and physiology. Ibn Rushd divided his book into seven sections: Anatomy of Organs, Health, Disease, Signs (Symptoms), Medicines and Foods, Preservation of Health, and Healing of Diseases. He touched upon descriptions of the diseases known in his time in a general sense, but he did not delve into the details of clinical treatment as a practicing physician; he left this matter to his friend, the physician Ibn Zuhr, who was introduced above.

The scientific value of the book lies in the diagnosis of certain diseases through the indicators that appear, such as the consistency and color of urine and blood, the intensity of fever, pulse rate, and bodily perspiration. Furthermore, he addressed the Theory of the Four Humors, which was the backbone of Islamic medicine and the basis upon which diseases were diagnosed. He identified the types of medicines—particularly herbal ones well-known in al-Andalus—that induce changes in the human body regarding heat, cold, moisture, or dryness.

Additionally, he provided a valuable explanation of the nature of how herbal medicine functions within the human body.

5. The Compendium on Simple Drugs and Foods by Ibn al-Baitar, Muhammad Abdullah ibn Ahmad Diya al-Din al-Andalusi al-Malaqi²²:

The leader of botanists and herbalists, born in the last quarter of the sixth century AH (twelfth century AD). His most famous work is the botanical encyclopedia titled *Al-Jami' li-Mufradat al-Adwiya wa al-Aghdhiya*, in which he described more than one thousand four hundred plant, animal, and mineral drugs. Three hundred of these were of his own discovery, and he clarified the medical benefits of each. His book was issued in four volumes.

Ibn al-Baitar was among the most prolific scholars; he studied plants and their properties across vast lands, and his research had a profound impact on advancing this science through significant milestones. His book, *Al-Jami'*, commonly known as *Mufradat Ibn al-Baitar*, is considered one of his most precious and famous works in the field of botany and simple drugs. He authored it after exhaustive studies and after traveling through various countries, depositing within it all his experiments and observations gathered during his long years of research. It is an alphabetical lexicon that bridges pharmacology and nutrition²³. His mentor, Ibn Abi Usaybi'a, praised him, saying: "I found him to possess a vast abundance of knowledge and expertise. He would not mention a drug in response to a questioner without specifying its exact location in the books of Dioscorides and Galen... He was reliable in what he transmitted, an authority for all... and in Egypt, he was the chief of the physicians and all herbalists"²⁴. Similarly, the historian Angel González Palencia lauded the value of *Al-Jami'*, stating: "It is the most complete and detailed work authored by the Arabs in this field. In its compilation, he relied on numerous books by previous authors such as Ibn Juljul, al-Ghafiqi, and Ibn al-Rumiyya. it comprises more than 2,330 entries, in which he gathered everything mentioned by his Greek and Arab predecessors regarding drugs, adding three hundred drugs that no one before him had referenced"²⁵.

Adopting a scientific methodology based on investigation, exploration, experimentation, and observation as the foundation for studying plants, herbs, and drugs, Ibrahim bin Murad—who relied on the Arabic text and the French translation of the book—confirmed that *Al-*

Jami' contains 2,353 specific medical substances and 931 explanatory synonymous terms²⁶.

Researchers interested in the history of Andalusian civilization, when discussing the influences of Islamic civilization in al-Andalus on European progress and development, have often identified a phase of indirect influence. This phase lasted three centuries and established the first step toward influencing the Western mentality. During this period, successive missions traveled from Europe to the cultural centers in al-Andalus. These embassies came from the Christian kingdoms in northern Spain, with delegations coming and going. Among these were scientific missions that benefited Europe; upon returning from al-Andalus, these scholars became scientific beacons, illuminating and spreading knowledge, which had a significant impact on the European Renaissance.

These scientific missions resulted in the transfer of numerous sciences and branches of knowledge to Europe through students arriving in the Andalusian territory for study, through the Mozarabs (the local Arabized Christians), and thanks to the Jews who moved to Europe fleeing the persecution of the Inquisition following the fall of Granada—the last Islamic city in Spain—in 898 AH / 1492 AD²⁷. Al-Andalus was a center of cultural radiance that led European states to seek, through their embassies, the strengthening of scientific and cultural ties. This civilizational contact had a lasting impact on the European West, particularly in the field of rational sciences.

Conclusion:

The Muslims in al-Andalus established a sophisticated civilization whose vestiges remain a testament to its greatness to this day. This civilization permeated all aspects of life, particularly science in its various branches. Medicine was among the sciences in which Andalusian Muslims excelled; the region produced physicians who successfully treated various diseases afflicting the inhabitants of the Iberian Peninsula. Furthermore, they enriched European societies with their findings. Al-Andalus served as one of the primary centers from which Europeans drew science and knowledge, benefiting significantly from it in achieving their Renaissance. These medical treatises continued to be taught in European universities until the nineteenth century.

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