Review Article

Qarābādhīn (Pharmacopoeia) in *Greeco-Arabian* era : A Historical and Regulatory Perspective

Mohd Akhtar Ali[1], Hamiduddin[2]

Abstract

Qarābādhīn can be termed as pharmacopoeia, contains compiled form of compound formulations or recipes. Importance of *Qarābādhīn* gradually increased and acquired an imperative status. The history of *Qarābādhīn* starts from Chiron, Aesculapius, Hippocrates, Dioscorides and Galen in Greco-Roman era. Many of early and medieval Islamic and Arab physicians play vital role and immense original contribution in this discipline and authored important and essential *Qarābādhīn* with systemic and scientific approaches. Although some of them could not reach the present day, many of the manuscripts can be found in various libraries across the world. Since the Arab Caliphates appreciated and patronized the fields of medicine acquired from Greeks and worked for its development, this period also known as *"Greco-Arabic era"*. In this work the evaluation of *Qarābādhīn* (particularly written in Arabic or Greek language) was done in historical and regulatory perspective particularly in Greek era and later on in Medieval Islamic era. The findings of the review indicate the importance and regulatory status of *Qarābādhīn* and provide information about it. It can be helpful to explore *Qarābādhīn* and related publications of Greek and Medieval Islamic Arabic period, which gives foundations for the present-day pharmacopeias. Since these documents also take into account ethical considerations, its utility in the fields of medicine and medical ethics should be investigated.

Keywords: *Qarābādhīn*, Pharmacopoeia, Greek, *Medieval Islamic* Medicine, *Kūnnāsh*, Unani Medicine.

International Journal of Human and Health Sciences Vol. 05 No. 04 October'21 Page : 388-404
DOI: http://dx.doi.org/10.31344/ijhhs.v5i4.348

Introduction

According to World Health Organization (WHO), traditional medicine (TM) is an imperative and often underestimated part of health services. In some countries, the term complementary medicine (CM) is preferred instead of traditional medicine or non-conventional medicine. TM has a long history of use in health sustenance, disease prevention and treatment, particularly for chronic disease.[1] The Unani System of Medicine, as its name suggests, originated in *Yūnān*, an Arabicised name for Greece. The Unani System of Medicine is a medical system that deals with the management of health and diseases. It provides preventive, promotive, curative and rehabilitative healthcare with holistic approach. The fundamental framework of this system is based on deep philosophical insights and scientific principles, including the Empedoclean theory of four elements, four proximate qualities (*kayfiyāt*), four humours (*akhlāt*) and temperament (*mizāj*).[2] Unani as a traditional system is the name used during British colonial age and post-colonial age by Indo-Muslim physicians to identify the medical school introduced and developed in the Muslim culture of the Indian Sub-Continent from 12th-13th century onwards. The word *Unani* literally means 'Greece' in Arabic, due to its foundation from Greek and Galenic theory and thereafter inherited and transmitted by Arab and Persian physicians.

1. MD, Assistant Professor, Department of Ilmul Saidla (Unani Pharmacy), Z.H. Unani Medical Collage & Hospital, Siwan, Bihar, India-841226.
2. MD, Assistant professor, Department of Ilmul Saidla (Unani Pharmacy), National Institute of Unani Medicine (NIUM) Autonomous organization under Min. of AYUSH Govt. of India Kottigepalya, Magadi main Road, Bengaluru, India, 560091.

Correspondence to: Hamiduddin, Assistant professor, Department of Ilmul Saidla (Unani Pharmacy), National Institute of Unani Medicine (NIUM) Kottigepalya, Magadi main Road, Bengaluru, 560091, India. E-mail: drhamid2003@rediffmail.com

This term is not used in Arabic literature and medicine was simply referred as *tibb* in Arabic literature.[3]

The words *Qarābādhīn* or *Aqrābādhīn* or *Abādhīn* come from Greek *graphidion*, meaning a small book or writing[4] or list or registry, which includes important pharmacological writings in traditional Islamic medicine. It describes in detail the methods of preparation of drug formulations, its preservation and administration. It can be a part of a book or a separate work itself.[5,6] It also means that, a book which consists of *Al-Adviā Al-Mūrākkābā* (compound formulations).[7] According to Allama Ibn Qayyim al-Jauzi al-Adviā, *al-Mūrākkābā* also called *Aqrabazeen*,[8] which means *Kitāb al-Adviā Al-Mūrākkābā* or *Qanūn al-Adviā* (dispensatory or pharmacopoeia).[9,10] It has also meanings such as *Lughat al-Adviā* (vocabulary of drugs)[11] and *Tarkeeb al-Adviā* (processing of drugs).[12] According to Makhzān-ul-jawāhār, *Qarābādhīn* is a book in which prescriptions and compound formulations are mentioned. It is also mentioned synonym as *Kitāb Adviā Murākkābāh*, *Qanūn al-Adviā*, and in English it can be termed as pharmacopeia or dispensatory.[13] Allamā Kashmīrī (1875-1933) mentioned *Khawās al-Adviā Al-Mūrākkābā* (property of compound formulations) as *Qarābādhīn* and *Khawāsu al-Mufrādāt* (property of single drugs) as *Tazkīrā*.[14] Another term *Kūnnāsh* is used for the book on formulations / drugs. The Kunnāsh refers to a genre of medical writing consisting of a compilation of medical theory and practice to be used by clinicians.[15] It has Syriac origin, stems from the word *Kūnāshā* which has meanings such as a compendium, a summary, or a basic documentary in which various branches of medicine are discussed.[16-18] *Kūnnāsh* is like a register that consists of rare and beneficial things.[19, 20] Having meanings of journal or notebook, it also refers the principles which are essential.[21]

Contemporary pharmacopoeia can be defined as an '*Official code including a particular list of the established preparations of drugs and medicine with descriptions of their physical properties, tests for their physical properties, test for their purity, identity and potency'*.[22] It is a book describing drugs, chemicals, and medicinal preparations; especially one issued by an officially recognized authority and serving as a standard, which can also be termed as a collection or stock of drugs.[23] Pharmacopoeia, (aka pharmacopeia) is a book published by a government, or otherwise under official sanction, to provide standards of strength and purity for therapeutic drugs. The primary function of a pharmacopoeia is to describe the formulation of each drug on the selected list. The provisions of the pharmacopoeia are binding upon all who produce drugs and who dispense them.[24] Pharmacopeia defines the standards for the preparations and standard doses of the drugs. Examples are Indian Pharmacopoeia (IP), British Pharmacopoeia (BP) etc. Similarly, information on product is revealed in National Formulary and British Pharmaceutical codex provides standards for which standards are not provided in BP.[22] The task of compiling most pharmacopoeias is carried out by experts in the professions of medicine, chemistry, and pharmacy at the request of the agency undertaking the compilation. Most programs are financed from government funds, but the British Pharmacopoeia and the Pharmacopeia of the United States are written by private, non-profit organizations with the sanction of their respective governments. Countries not having a national pharmacopoeia have adopted pharmacopeia of another country. International Pharmacopoeia were also recommended by the WHO in 1951 for minimizing or eliminating variations among national pharmacopoeias standards.[24]

When we compare it with *Qarābādhīn* the role of a modern pharmacopoeia is to provide quality specifications for drug and general requirements for dosage forms. The subsistence of such specifications and requirements is necessary for the proper functioning or regulatory control of drugs, [25] these are the basic features of a medicine legally introduced in the market; as efficacy, safety and quality are the main features of established medicine. Contemporary pharmacopoeia plays a basic role in establishing methods of testing and technical control. The quality of drugs, pharmaceutical ingredients or preparations listed in a pharmacopoeia must be considered by the manufacturer as the minimum level of the acceptable standard for medical use, to ensure efficacy under proper storage conditions.[26] The difference between pharmacopoeia and *Qarābādhīn* is that the pharmacopoeia has official state, but the *Qarābādhīn* may or may not have official state. *Qarābādhīn* can be official, unofficial (not officially established) and non-official (not official)[27]. Modern pharmacopeia seems to have more authoritative approach when compared with classical *Qarābādhīn.* There are several texts in

Unani medicine in the name of *Qarābādhīn* of whose official status is still needed to be explored. As the medical tradition in Classical Islamic civilization was very different from the modern one, there were simplified official controls with drugs and pharmacies compared to the modern requirements. Learning from above mentioned detail, to some extent and aspects *Qarābādhīn* can be equated with Pharmacopeia. Both *Qarābādhīn* and Pharmacopeia contain description of single as well as compound formulations or preparations.

The aim of this article is to describe and discuss *Qarābādhīn* particularly as a dispensatory or text containing formulations or medicinal preparations or formulary. This article does not deal with writings on single drugs and the Materia-Medica, which is generally on single drugs and deals with their nature, effect or therapeutic property, and use of remedies for the prevention and removal of disease. This term was derived from the work of Dioscorides is now replaced with pharmacology.[28, 29] In this work text in the name of *Qarābādhīn* as a dispensatory were discussed and text on single drugs is not considered. Although some of the Materia-Medica on single drug played very important role and served as a basis for developing dispensatory for example *Kitāb al-Hāshāyesh* (*De Materia Medica*) by Pedanius Dioscoride.[30] Origin of dispensatory is from Medieval Latin dispensatorium, which are books containing a systematic description of drugs and of preparations made from them, it can also be denoted as a handbook on the preparation and use of medicines or pharmacopeia [31], this text deals in this area of work.

Resources for review were selected from Unani classical texts, Internet classical archives, manuscripts, journals and contemporary texts. Attempt was made to collect the *Qarābādhīn* text from available and feasible resources there might be chance of missing some texts related to *Qarābādhīn* in Greek and Medieval Islamic era due to the inaccessibility of some of the resources. Criteria for the choice made for this work is that only those *Qarābādhīn are* described in this article which are particularly written in Arabic or Greek language and interpretation is made on the canvas of Greco-Arabic medicine, i.e. Unani medicine as practiced in this name in Indian subcontinent.

Qarābādhīn or pharmacopeia written in Persian and Urdu language and in pre-colonial, colonial and post-colonial Indian subcontinent will be described in the upcoming work. Many *Qarābādhīn* in Persian and Urdu language which are originally sourced or inspired from Arabic language *Qarābādhīn* for example *Qarābādhīn*-e-Qadri, *Qarābādhīn*-e-Azam, and *Qarābādhīn*-e-Kabir etc are also not depicted in this work.[32]

From plenty of published information by Unani physician books on *Qarābādhīn* are of immense importance from treatment point of view. *Qarābādhīn* from modern pharmacopoeia perspectives have not been analyzed and comparative study on Unani *Qarābādhīn* with different text falls under the category of Unani pharmacopoeia according to era they were compiled.[33] Different dosage forms were in existence in Islamic medieval world such as pills, ointments, confections, tinctures, suppositories, and inhalants. These formulations were prepared according to medieval Islamic and Greco-Arab tradition that forms the basis for current conventional products.[34] Greco-Arabic medicine now nurtured and patronized in Indian subcontinent as Unani Medicine, *Qarābādhīn* were written in *Greek*, *Arabian*, *Persian* and Indian. *Qarābādhīn* written in Greek and particularly in Islamic Era have been examined and discussed mostly on compound drugs. Availability of manuscript on *Qarābādhīn* has been mentioned as per the reference text. This work can help in creating better understanding of these publications and can act as a key for information and promotion thereby helping in better utilization.

Qarābādhīn **in Antiquity and Greco-Roman era**

Qarābādhīn was not actually accorded centralized status in early period, now in contemporary era it becomes more important and essential requirement for every existing system of medicine as well as for every country. Earliest *Qarābādhīn* was known in *Sumerian* history (2004 BC). *Egyptian* manuscript *Ebers Papyrus* (1550 BC) which deals with herbal medicine can be identified as the major initial work in this field, which includes most earlier information that contains 876 prescriptions made up of more than 500 substances, including many herbals.[27] Diocles (240-180 BC) of Caryotos, a pupil of Aristotle (384-322 BC) written an important treatise on Materia medica named as *Rhizotomikon*. This book was now lost in 460 BC. Hippocrates (460-370 BC), due to his tremendous contributions to medicine and pharmacy is accredited as the father of medical science. He has described about 400 drugs in his written work which can

be attributed as his contribution in the field of pharmacopea.[35] *Edwin Smith Papyrus* in Egypt (1600 BCE), Pliny's pharmacopoeia (4th century), Galen (129 AD-c. 200/c. 216) who authored 129 books, including an exclusive pharmacopoeia are few other examples of existence of pharmacopeia in this era.[27]

Some important *Qarābādhīns* in Greco-Roman era

***Hippocratic Corpus* (c. 460 – 370 BC)**

It contains many important medical treatises including the Hippocratic Oath. Compared with the Egyptian papyri, the Hippocratic writings exhibit an enhanced understanding of brain function and structure. It perfectly attributed the primary control of the body's function to the brain.[36]

***Kitāb al-Hāshāyesh* (*De Materia Medica*)**

It is authored by Pedanius Dioscorides (40–90 AD) Ancient Greek physician, pharmacologist, botanist and biggest pharmacopoeian. This book is known s as *De Materia Medica* (Latin for "*On Medical Material*" and considered to be precursor to all modern pharmacopoeias), remained in use until about 19th century as a core of pharmacopeia. Each entry includes a drawing, a description on the plant, an account of its medicinal qualities and method of preparation, and precautions / warning about undesirable effects. The work was written between 50 and 70 AD, about 600 plants were discovered, along with some animals and mineral substances, and around 1000 medicines made from them. It is divided into 5 volumes. The Volume I is related to aromatics, oils, ointments; Volume II is related to animals to herbs; Volume III is related to roots, seeds and herbs; Volume IV is related to roots and herbs, and Volume V is related to vines, wines and minerals. Volume V covers the grapevine, wine made from it, grapes and raisins and various metal compounds, such as zinc oxide, iron oxide and verdigris. Stephanos who was son of Basilios, a Christian living in Baghdad under the Khālīfā Motawākkīl made an Arabic translation of *De Materia Medica* from the Greek in 854 and this copy was corrected by Ishāq ibn Hunain. In 948 the *Byzantine Emperor Romanus II*, son and co-regent of Constantine Porphyrogenitos, sent a marvellously illustrated Greek manuscript of *De Materia Medica* to the Spanish Khālīfā, Abd-Arrāhmān III.[30] This book was circulated as illustrated manuscripts, copied by hand, in Greek, Latin and Arabic all over the medieval period. From the 16th century on, Dioscorides' text was translated into Italian, German, Spanish, and French, and in 1655 into English. The Greek Herbal of Dioscorides, translated to English by John Goodyer in 1655, and was edited by R.T. Gunter in 1933. Thenceforward many translation works are done for *De Materia Medica* (*Kitāb al-Hāshāyesh*), e.g., in 2000 it was translated to English by Tess Anne Osbaldeston, based on the translation of John Goodyer (1655), published in Johannesburg by Ibidis Press. Another translation is done in 2005 by Lily Y. Beck, which is published by Hildesheim, Olms-Weidmann.[37]

***Al-Adviā Al-Murākkābā* (The compound drugs)**

It is written by Jalīnūs (Galen 129 AD-c. 200/c. 216) and is also known as *Kitāb Tarkīb al-Adviā*. It is divided into two parts, *Qatājānīs* and *Kitāb Al-Mayāmīr*. *Qatajanīs* consists of 7 chapters of *Murākkābāt* (Formulations) with its *Jins* (Category). All categories of drugs were mentioned like *Mundāmīl-e-Qurūh* (ulcer healing), *Muhāllīl* (resolvent), *and Munbite Lahām* (tissue grower / healing) etc. with methods of compound formulation, by these characteristics this part of book is also called as "*fi trākīb al-Adviā alāl Jumāl wa al-Ajnās*". *Kitāb Al-Mayāmīr* consists of 10 chapters of *Mūrākkābāt* with description of compound drug and its delivery system, dosage forms according to mode of administration and targeted action to diseased organ. It described all organs 'head to toe'. The word *Mayāmīr* is plural; its singular is *Maymār* means 'way'. It may be named for purpose of indicating that only these ways you can formulate a compound drug and apply.[38,39] The copy of the manuscript is preserved in *Aḥmād Salis* (III) (1673-1736) in state of the Deccan Plateau, India and Arabic Department of Istanbul.[40] It is translated into Arabic by Hubaish al-A'sām.[39]

Kitāb ila Aglūqān fi Shīfā al Amrāz

It is a Galen's commentary, including a summary of the Alexandrian compendium of Galen's works. This manuscript (from the 10th century) consists of two volumes that include details regarding various types of fevers (*Hūmmāyāt*) and different inflammatory conditions of the body. More importantly, it includes details of more than 150 single and compound formulations of both herbal and animal origin. The book illustrates an insight into understanding the methods of treatment and traditions in the Greek (Unani) and Roman eras. It was translated into Arabic by Hunāyn ibn Ishāq (809-873 AD). It is preserved in the Library of Ibn Sīnā Academy of Medieval Medicine and Sciences, Aligarh.[41]

Kitāb al-Kūnnāsh fi al-Tib **(Medical Compendium in Seven Books)**

It is written by Paul of Aegina also known as Paulus Aegineta (625-690) in Greek and believed as last author of Greek language. The title in Greek is called '*Epitomes iatrikes biblio hepta'*. The seventh book contained an account of the properties of all medicines, first of the simple then of the compound medicines. The work became a standard text throughout the Arabic World for the next 800 or so many years. It was the most complete encyclopaedia of all medical knowledge at the time.[36]

Kūnnāsh Ahron **(Medical Compendium of *Ahron*)**

It is written by Ahron Bin A'yun Al-Qāss (d. 600) in Suryānī language and interventions of *Folās al-Ajanetī* (Paulus Aegineta 625-690). It is quoted in *Kitābul Hāwī* with great importance, and it is the first academic book in Arabic.[42] It was published in 709 AD by Umār Bin Abdul Azīz (Reign 717-720) after 40 days continuous *Istikhārāh* (Way of consultation from Allah / God) and distributed it in his territory[43,44] One of the very first books which consist 30 chapters which were translated from Greek into Syrian and then into Arabic by Masīrhūbais (Masārjoweh or Māsārĝāwai al-Bāsrī) with addition of two chapters from himself, due to the book's containing 32 chapters in period of Marwān Bin Hakām (period of *Khilāfat* 683-84).[39] Later on, *Hunāyn ibn Ishāq* has provided a better translation in Arabic.[45]

Qarābādhīn **of Medieval Islamic Era in Arabic language**

In the medieval Islamic period, the department of pharmacy developed a lot which leads to numerous new formulations. These developments were the foundations for the field of pharmacy. The physicians and scientists of Islamic era made this department valuable, precious, and wrote authentic and referential *Qarābādhīn* (Pharmacopeia's) with systemic and scientific approaches that was not found before the Islamic period. Caliphates of Arab gave attention to medicine acquired from Greeks, and worked for its development, this period also known as "*Greco-Arabic era*".[12] The first *Qarābādhīn* in this period was written by Yuhānnā Bin Māswaih (777-857 AD), after that several *Qarābādhīns* written in Arabic, such as *Qarābādhīn Sābūr ibn Sahl* (d.869), *Qarābādhīn Yaqoob Kīndī* (801-873)[46] *Qarābādhīn Hunain Bin Ishāq* (830-910), *Qarābādhīn Zākāriyā Rāzi* (854-932/925) etc. Most of them are translated into Latin and later published.

Some important *Qarābādhīns* in Arabic language

Qarābādhīn-e-Yuhānnā ibn Masāwaih **(Formulary of Yuhānna ibn Masāwaih)**

It is written by Yuhānnā ibn Masāwaih (777-857), known in Latin as Mesue, Johannes Damascenus, Masuya, Mesue Major, and Msuya. Masāwaih was personal physician to four caliphs; especially he was employed by Harūn al-Rāshīd (reign 786-809) with the translation of Greek books, mainly medical, found at Ankara and Amorium. According to the authors Beeston and Nigrami, Masāwaih was the head of the Institute 'Bāyt al-Hikmāh'. He was credited with the authorship of about fifty works.[40, 47] He composed a considerable number of Arabic medical monographs, on topics including fevers, leprosy, melancholy, dietetics, eye diseases, and medical aphorisms. An early translator of Greek material into Arabic, he also composed a treatise on poisons and their dangers (*Kitāb al-Sumumāt wa-dāf` mādārrīha*) which is preserved today only in fragments.[48] The book was published as '*De consolatione medicinarum*' in Modena City in 1475.[49] This Latin translation was known as base of the first London Pharmacopoeia[50]

Qarābādhīn Kabeer **or *Aqrābāzeen*** **(The big formulary)**

It is a first medical book on antidote also called as *Aqrābādhīn* written by Sābūr ibn Sahl (d.869). He was a 9th-century Persian Christian physician from the Academy of Gundīshāpūr.[51] He was principle of Jundī Shāhpūr and great physician in the period (847-861) of al-Mutāwākkīl (822-861).[38] *Aqrābādhīn* was believed to be first *Qarābādhīn* that is descriptive and acceptable by government authority. It includes 22 volumes. It was used in hospitals as a manual in that period[39] and possibly the earliest of its kind to influence Islamic medicine. This antidotary enjoyed much popularity until it was superseded by Ibn al-Tilmīdh's version later in the first half of twelfth century. It was an authentic and referential text for many years.[44] The original Arabic text was lost, but the Latin translation was used as a model for future Pharmacopoeias.[52]

Qarābādhīn al-Sāghīr **(The small formulary)**

It was also written by Sābūr ibn Sahl (d.869). It consists of 17 chapters like *Theriacs* and electuaries, decoctions, pills and other dosage forms. The Latin translation was published named as '*Dispensatorium paruum*' and now the English translation is also published as '*Sābūr Ibn Sahl* the

Small Dispensatory' translated from the Arabic (Study and Glossaries) by Oliver Kahl, Brill Leiden, Boston in 2003.[53]

***Qarābādhīn Yāqūb al-Kīndī* or *Al-Aqrābāzeen* or *Kitāb fi al-Qarābādhīn* (The formulary of *al-Kīndī*)**

This *Qarābādhīn* was written by Abu Yūsuf Ya'qūb ibn 'Isḥāq aṣ-Ṣabbāḥ al-Kindī (Latinised as *Alkindus* 801-873). He was very famous, ingenious and proficient physician, philosopher and astrologer. He was only person to be titled as an Arabic philosopher.[39] *Qarābādhīn Yāqūb al-Kīndī* was a very important *Qarābādhīn* in this contest as it was written on the basis of pharmacopoeia.[12] His manuscript is present in Ayasofya Library, Istanbul, Turkey. Yāqūb al-Kīndī was also famous as a translator and author.[40]

***Kūnnāsh Hunain Ibn Ishāq* (Medical Compendium of *Hunain Ibn Ishāq*)**

It was written by Hunain Ibn Ishāq (Latinised as *Iohannitius* 809-873 AD), who was a famous and ingenious physician. He was the first who propagate the preparation of *surma* (*kohl*),[39] and wrote many famous books on this topic. His *Kūnnāsh* is a concise form of *Kūnnāsh Folās al-Ajanetī* (Paulus Aegineta 625-690 famous as *Kūnnāsh al-Surāyyā*),[38] which is a very famous book. He also wrote "*Kitāb Al-Ahjār*" or the book of stones"[54] and *Kitāb fi Asrār al-Adviā al-Mūrākkābā*.[40]

Zakhīrā al-Iskāndār al-Malīk bil Faiqālās Zīl Qārnain

This book was discovered after conquering '*Umudia*' in the period of Abū Isḥāq Muḥammad ibn Hārūn al-Rashīd (796- 842), better known by his regional name *al-Muʿtaṣim bi'llāh*. This book was preserved in pupil of *Iskāndār Zīl Qārnain bin Failāfus Entoqus's* prayer house which was a collection of rare books. This book was written on gold plates, each page has half finger thickness, 91 cm (1 *guz*) in hight and 273 cm (3 *guz*) in width. Every word was like barley in thickness. This book was consisting of 360 pages and 12 lines in every page and was Greek in language and in some place Roman in language and book was preserved in box. *Al-Muʿtaṣim bi'llāh* ordered to translate it into Arabic, after authentication it was published as '*Zakhīrā al-Iskāndār al-Malīk bil Faiqālās zīl Qārnain*'. This book consists of 10 chapters; most of the chapters are related to pharmaceutics and compound formulations like *Iksirat* (elixirs), *Samūmāt* (poisons), *Tiryāqāt* (antidotes), *Bukhūrāt* (Inhalation drugs) etc. The copy of manuscript is preserved in Hyderabad India dated 1069 H/1659 and name of writer of this copy is Mohammad Shāfi.[44]

***Firdous al-Hikmāh* (Paradise of Wisdom)**

Abu al-Hasān Alī ibn Sahl Rabbān al-Tabārī (838–870) wrote it in Arabic as original text, which is also called *al-Kūnnāsh*. He also translated it into Syrian, to give it wider usefulness. It is one of the oldest encyclopedias of *Islamic* medicine, based on Syrian translations of Greek sources (*Hippocrates*, *Galen, Dioscorides* and others). It is divided into 7 sections and 30 parts, with 360 chapters in total. Part VI is related to single and compound medicaments and toxicology. A German translation by Alfred Single of the chapters on Indian medicine was published in 1951.[55]

***Kitāb al-Hawī al-Kabeer* (*Continens Liber* or *The Large Comprehensive*)**

It is written by Abū Bakr Muhammad ibn Zakārīyyā al-Rāzī (Latinised as *Rhazes* or *Rasis* 854-932/925). It is a great and very famous book in Unani medicine. This book was not completed nor organised by its author.[38] It was organised by Ibnul Ameed (d.970) a *Vizier* (minister) of Caliphate *Rukn al-Dawla* (898-976 AD). This book is called "*Liber Continens*" in Europe. "*Al-Hawī*" may be stated as Encyclopaedia of *Unani-Greco-Arab* Medicine.[56] According to the author of Arabian Medicine, 30 manuscripts of *al-Hawī* are available in British museum, 3 manuscripts are in Bodlian library, 5 manuscripts are in Escorial library, some manuscripts in Meunic, some in Chanpetro and some manuscripts are in Berlin. Some of them can be found also in Indian libraries such as, Riza Library Rampur, Moulana Azad Library Aligarh, Khūdā Baksh Oriental Library Patna, National Botanical Research Institute Lucknow, Andhra Pradesh Oriental Manuscript Library and Research institute Hyderabad. Escorial library manuscript can be considered as a complete manuscript of *al-Hawī*. Its basic translations in various languages especially Arabic that is published from *Dairatul Ma'rif Hyderabad* in period of 6 years (1955-1971) in 23 volumes.[40] The 20th and 21st volumes are related to *Adviā Mufradā* (single drugs), their actions and use, and self and colleagues' experiences. The 22nd volume is related to *Saidala* and information of *Majhulul Asma Adviā* (unidentified drugs), describes principals of pharmacy, dosage form and its methods of preparation, and mentions information about unknown drugs.[56] Some great physicians like Ibn Baja, Alī Bin Sulaiman, Rasheeduddin

Jami, Muhazzabuddin and Ibn Tilmīdh concise *al-Hawī*.[38]

Al-Qarābādhīn al-Sāghīr /Al-Qarābādhīn al-Mukhtāsār

It is a 14-page treatise, describing compound drugs, written by Zakāriya Rāzī (865-925). Manuscript can be found in Kutub Khana Aqā Hussain Malīk, in Iran.[57] Only important chapters and points are mentioned concisely. It's another copy is available in Welcome Library, UK.[58]

***Khawās al-Ashyā* (Properties of objects)**

It is written by Zakāriya Rāzī (865-925). This book consists of one *Muqāddimāh* (introduction) and 21 chapters and all chapters are related to *Qarābādhīn*. This book was mentioned in *Uyun al-Anba fi Tabāqāt al-ATībba* by Ibn-e-Abi Usaiba and in *Tarikh-e-Tībb* by Hakim Mohammad Hassan Nagrami, It was published from Ghaemiyeh Computer Research Institute of Isfahan.[59]

***Kūnnāsh fi al-Tībb* (The Basic Documentary of Medicine)**

It is a valuable *Kūnnāsh* in Arabic language related to formulations, according to diseases with details, written by Yāqūb ibn Zakārīyā al-Kashkāri (c. 895-929). It is divided into 65 chapters; the first chapter was copied from *Kūnnāsh Ibn Sarābīyūn*. The book contains practical aspects and applied knowledge experienced by author in hospital, methods of treatments. The book was published with editing of Alī Shīrī from Ghaemiyeh Computer Research Institute of Isfahan in 1996.[60]

Al-Bughyāh fi Al-Adviā Al-Mūrākkābā

It is also known as *Kitāb al-Adviā al-Mūrākkābā* written by Ahmed bin Jaafār bin Brahim Ibn al-Jāzzār al-Qayrāwānī (Latinized name *Algizar* 895–979).[61] He was an influential 10th-century physician who became famous for his writings. It is very valuable book on compound formulation. The manuscript is preserved in Jarrah Halab in Syria.[40]

Kamīl Al-Snā'h (Part of *Qarābādhīn*)

It is written by Alī Ibn Abbās al-Majūsī (Latinised as *Haly* 930-994). It is a great, renowned and referential book that consists of both applied and theoretical aspects. It is included in encyclopedias of *Tībb*. It is also known as "*Kitāb al-Mūlkī" "Kitāb al-Qawaneen*" and "*Liber Regius*". Due to these great works, the author is known as "*Sahab-e-Kamil*". Avicenna said "if I would have saw *Kamīl al-Snā'h*' before writing of *al-Qanūn,* I would have never wrote it.[62] *Qutfī* stated "before *al-Qanūn, Kitāb al-Mulkī* was referential book for *Atībba*. *Kitāb al-Mulkī* is better in applied part and *al-Qanūn* is better in theoretical concept.[39] *Kimil al-Sanā'* was published in Arabic in 1866 in Lahore and in 1877 in Cairo which consists of 2 volumes, 23 *Maqlāt* (chapters), 783 *Abwāb* (subchapters). Every volume consists of 10 *Maqālāt* (Parts). In 10th *Maqālā* of volume 2 consists part of *Qarābādhīn* which have 28 *Abwaāb*.[56] *Kamīl Al-Snā'h'* was acceptable in Europe so it is initially translated in Latin language and first published in 1492 from Winos. Another translation in Latin is carried out by great philosopher Stephen that was published in 1522 with editing of Maikal Dokepela from Lanes and known as *Liber Regius*.[63] The Arabic text was published in India by *Matba Nami* and *Matba Nawalkishor Lucknow*.[40] In Indian subcontinent the Urdu translation by Ghulam Hasnain Kantoori is very popular and acceptable, and published by *Matba Nawal Kishor* Lucknow in 1889. It was many times reprinted by various publication centres.[56] A new publication of this book in Urdu was carried out in 4 volumes by Central Council for Research in Unani Medicine (CCRUM), New Delhi in 2010.[64]

***Kitāb al-Aqrābādhīn* (Book on Compound Remedies)**

Abū Bakr Ḥāmid Ibn Samājūn (2nd half of 10th century) composed this Arabic formulary. But it was thought to be lost, until the manuscript discovered at NLM (National Library of Medicine)

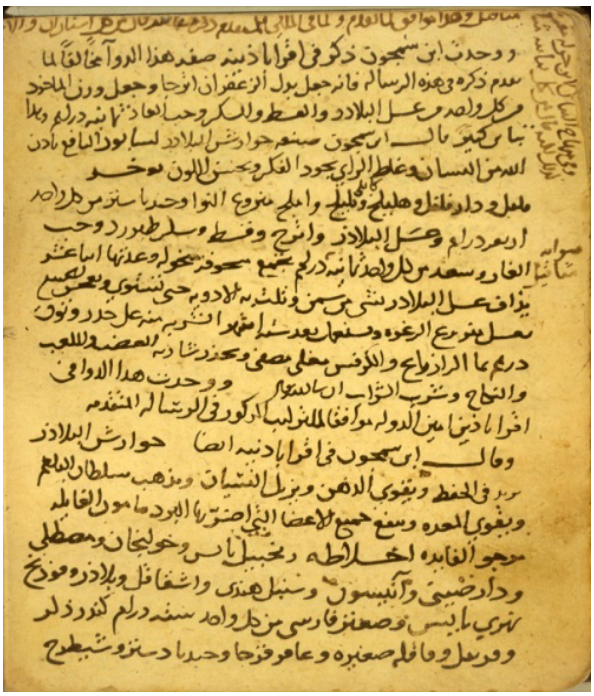

Figure 1: Kitāb al-Aqrābādhīn by Ibn Samajūn (From National Library of Medicine USA)

in USA (Figure 1). The 13th century physician and historian, Ibn Abi Usaybi'ah provided biographical information regarding Ibn Samajūn. He records a formulary titled *Kitāb al-Aqrābādhīn* as one of the two compositions of Ibn Samājūn. Extracts from this formulary are conserved in NLM MS A 3/II, item 2 NLM, USA, where the unnamed compiler states that he found these recipes in Ibn Samājūn's *Kitāb al-Aqrābādhīn*. The treatise begins with recipes useful for forgetfulness (which was the topic of the preceding item in the volume). Following recipes are said to be practical for a wider range of ailments, complaints of the head and brain dominate in it.[65]

Kitāb al- Mi'a fi al-Tībb

It is written by Abū Sahl 'Isa ibn Yahyā al-Masīhī al-Jūrjānī (972-1010). This book is very rare and Lazarus in *Unani Tībb*. It is also called *al-mā'a fi-l-sanā'a al-tabi'iyyāh*.[66] This book is divided into 100 chapters, why it is also called *Kitāb al-Mi'a*, *Mi'a* which means 'hundred' in Arabic. It has good sequence between chapters and every chapter has distinguished features and language, highly useful maters, concise quotes, multidimensional, innovative and creative thinking which increases its value and worth. The most important feature of this book is that it includes innovations, research, and development instead of repetitions. For example, it explains benefits and harmful effect of diet on the basis of taste.[56] It was first published in 1923 in Hyderabad Dakan. The copy of this book consists of 20 Abwab (chapters).[56] Many manuscripts can be found in various libraries, but manuscript of *Khūdā Bakhsh* library Patna includes all chapters. The first volume of this book was published in 2008 by CCRUM, which can be a guide for us to develop new ways and methods of research in Unani medicine.[67]

Kitāb al-Saidla* (*Saidānā*) *Fi al-Tīb

It is written by Abū Rayḥān Muḥammad ibn Aḥmad al-Bīrūnī (973-1048). This book consists of a preface and five chapters. It describes methods of identification of single crude drugs, terminologies used in *Saidla*. Discussion on words derived from various languages e.g., Arabic, Syrian, Persian, Greek, Baluchi, Afghan, Kurdi, and some Indian languages. It also mentions history about the writers and their treatises; detail of single and compound drugs alphabetically, description of *Abdal-e-Adviā* and so many other details. It was published in Persian language (translated by Baqar Muzaffar Zada) from *Farhangistan Zaban wa Adab Farsi*, *Giroh Nashr Aasar/Aasar Tehran* in 1383.[68] This was translated in Persian during 1211-1229 by Usman al-Kasani, and one manuscript (dated 1599) is available in *Maulana Azaad* Library, AMU, Aligarh,[43] one is in British Museum London, and one of them is in the self-library of *Muhammad Shafee* Lahore and Tehran.[43] This copy was published (incomplete) by Iraj Ifshar in Tehran in 1973.[43] The Arabic text with English translation "*Kitāb al- Saidānā fi al-Tībb*" was done by Hakim Mohammad Said and published by Hamdadrd National Foundation Karachi in 1973 on the occasion of birthday of al-Biruni.[40]

***Kitāb al-Qanūn fi'l-Tībb* (The Canon of Medicine)**

It was written by Abu Alī Husain bin Abdullāh bin Hasān bin Alī Sīnā (Latinized name "Avicenna", 980-1037). It is a great book of *Unani Tībb*, which has a status of 'Thesaurus of *Unani Tībb*'. The good sequence of topics, philosophical phraseology and innovative articles are among the main causes of popularity and acceptability of the *Canon* in all over the world. According to Hakim Sayed Zillurrahman, "*Al-Qanūn fi'l-Tībb* is above the furore and unfading for knowledge of universe". It is one of the greatest treatises in this field.[56] *Canon*'s distinguishing property comes from including useful and recommended topics, instead of unnecessary, useless, and repeated subjects. It consists of 5 volumes. It is divided into four big topics e.g., *Kulliyat* (Volume I), *Mufradāt* (Volume II), *Moalajat* (Volume III-IV) and *Mūrākkābāt* (Volume V). The 5th volume is very important as a *Qarābādhīn*.[43] It is translated in various languages in all over the world e.g., Latin, Hebrew, Persian, Turkish, Uzbek, English, Germen and Urdu. Only in Europe, 87 translations were done in various languages mostly in *Latin, Germen* and *Hebrew* that is a big example depicting its acceptance, resonating and popularity.[56] The manuscripts of *Canon* are preserved in various libraries all over the world. It was a part of syllabus for centuries in West and in East, still important part of syllabus in learning of Unani medicine in some countries.[69]

Kitāb al-Kifāyā fi al-Tīb

This book is also known as *Kifāyāh al-Tabīb* written by Abul Hasān Alī ibn Ridwān ibn Alī ibn Ja'far al-Misrī (986-1067). It is a very rare book related to *Qarābādhīn* in Arabic language. *Kifāyāh al-Tabīb* did not mentioned by *Ibn-e-Abi Usaiba* in list books of Alī ibn Ridwan. Only one manuscript (No. 1952 consisting of 56 pages) is

preserved in *Maktaba al-Ghouta*, South Minya. It is written on the cover of this manuscript '*Kifāyāh al-Tabīb li ibn Ridwān*'. The book consists of a chapter for methods of treatment then 22 chapters related to *Qarābādhīn.* It starts with *Hubub* (pills) and *Ayārījāt* (a semi-solid dosage form) and it ends with *Shamumat* (inhalation drug with scent) and *Masrudat* (a type of diet) along with '*Darajat-e-Adviā'* (stages of drugs). '*Risālāh fi al-Nabdh'* and '*Risālā fi al-Qarurāh'* are also attached in this manuscript. It is published by *Dar al-Rashid Li al-Nashr* for the first time in Iraq in 1981 with editing and research of Dr Salman Qataya, and now it is also published by Ghaemiyeh Computer Research Institute of Isfahan in 1966.[70]

***Al-Aqrābādhīn al-Kabir Libn Tilmīdh* (Formulary of *Ibn al-Tilmīdh*)**

It is written by Amīn al-Dawlāh Abū-alḥasān Ṣaʿīd bin Hibāt Allāh bin Ibrāhim Ibn al-Tilmīdh (1073–1165). It was most valuable pharmacopoeia in 12th century and was compiled by various other pharmacopoeias. *Al-Aqrābādhīn al-Kabir* accepted as a model pharmacological work in the hospitals of the Islamic civilization, which dominated over the earlier work by Sābūr ibn Sahl.[71] It consists of 20 chapters, such as chapter for *Aqras* (tablets), chapter for *Hubub* (pills) chapter for *Ayārījāt* and chapter for *Safufat* (powders), etc. It was organized on the basis of dosage forms with description of preparation of formulations like *Nabidh* and *Handiqun* (a dosage form prepared by honey). It was based on several formularies and abridged by Ibn al-Tilmīdh for use in the Adudi Hospital in Baghdad.[72] The manuscript (WMS. Or. 9) is preserved in Welcome Library, UK.[58] Other manuscripts are preserved in London, British Library (OIOC, MS Or. 8293, copied in 1228/625); Cairo, Dar al-Kutub (MS *Tībb* 1212 and MS *Tībb* 141 item 3); Oxford, Bodleian (MS Marsh 537 item 10, folio 182b-226b) and US National Library of Medicine (MS A 3/I, item 1).[72]

***Minhāj al-Bayān* (The Course of Explanation)**

It is written by Abū 'Alī Yaḥyá ibn '**Īsá** Ibn Jazlah al-Baghdadi (Latinized as *Buhahylyha Bingezla* d. 1100) a great physician of Baghdad. This Arabic handbook of pharmaceutics covers not only simple medicine (Materia medica) but also compound remedies (Figure 2). The introduction includes seven chapters (*fasal*) regarding compound remedies, followed by simple drugs, presented in alphabetical order. It was written after Ibn Jazlāh's well-known treatise on regimen, *Taqwīm al-abdān*, and it was dedicated to the 'Abbasid caliph

Figure 2: *Minhāj al-Bayān* by Ibn Jazlah (From National Library of Medicine USA)

al-Muqtādi (reg. 1075-1094). Ibn Jazlāh's treatise *Minhāj al-Bayān* is often referred simply as *al-Bayān* (The Explanation). Text named as *Tadbir al-aṭfāll* (regimen for infants), *Mukhtāṣār min mufrādāt Ibn Jazlāh* [*al-kitāb*] *al-mawsūm bi-al-Bayān* (Abridgement of the Simple Medicaments from Ibn Jazlāh's book called *al-Bayān*) and *Mulāffāq min al-Bayān* (A Compilation Taken from *al-Bayan*) which are catalogued in the section of dietetics all were extracted from book *Kitāb al-Bayān*. There are numerous manuscript copies of *Minhāj al-bayān* recorded in various libraries all over the world[73] such as Riza Library Rampur and Liden Library.[43] Translated by Jambolinus and known as the *Cibis et medicines simplicibus* in Latin.[74] Now this book was published from Ghaemiyeh Computer Research Institute of Isfahan in 1972.[75]

Aqrābādhīn idāh mahājjāl al-ilāj

The book is written by Tahir Ibn Ibrāhīm Ibn Muhammah Ibn Tahir al-Shājārī (d.1106), and dedicated to Qazī Abul Fazl Mohammad bin Hamādiā. The author had experiences in medical fields, especially in pharmaceutics. This book was compiled with only experienced and tested formulations.[61] A complete copy of the *Aqrābādhīn* (thirty-one chapters) exists in a composite volume in Library of University of California, Los Angeles (MS Ar.78 (V)). It is organized on the basis of dosage forms like *Matbūkhāt* (Decoction), *Maul Usūl wa Maūl Buqūl* (Extracts of roots and vegetables), *Hubub* (pills).[76] It includes chapters

such as medicine on nervine convulsion, gargles, and dietary advises for patients. The copy of manuscript is preserved in Khūdā Bākhsh Oriental Library, Patna [*Majmū'ah* No. 4 (I). Foll. 1-34].[77]

Qarābādhīn-e-Aḥmad ibn Farrūkh **(Formulary of Aḥmad ibn Farrūkh)**

It is written by Aḥmad ibn Farrūkh (fl. early 12th century). This is a *Qarābādhīn* (MS P 11, item 2) in 11 short chapters, and it appears to be the only preserved example of the writings of Aḥmad ibn Farrūkh. He was the teacher of the physician Ismail ibn al-Ḥusāyni al-Jūrjānī (d. 1136/531). He was also the author of a Persian Medicine Encyclopedia titled *Kifāyāh* that is no longer in existent, which had high reputation among scholars after the work of al-Jūrjānī's. Aḥmād ibn Farrūkh's name was often written as Aḥmād-i Farrokh. This reflects the Persian way of replacing the Arabic '*ibn'* ('son of') with the grammatical structure of *idafa* as '*i'*. The title and author are given in the heading, at the top of the page as *Min Qarābādhīn-e-Aḥmād ibn Farrūkh* ('from the Formulary of *Aḥmād ibn Farrūkh'*). The copy was completed by the same copyist as transcribed the previous item in the volume, which was completed on 5 Muhārrām 1248 [4 June 1832] by Ibn 'Abd al-'Azīm Muḥammad Samī'al- ṭabīb (The physician).[78]

Kitāb al-Qarābādhīn 'alá tartīb al-'ilal **(Compound remedies arranged according to ailment)**

Kitāb al-Qarābādhīn 'alá tartīb al-'ilal also known as *Kitāb Al-Qarābādhīn al-Kabeer* (see Figure 3) was written by Abū Ḥamid Muḥammad ibn 'Alī ibn 'Umar Najīb al-Dīn al-Samārqāndī (d. 1222)[61,79] One of the treatises commonly found in the collection known as *al-Najibiyat al-Samarqandīyah / Khāmsā Najībiyā*, which includes 1. *Aqrābādhīn* (*Kitāb al-Qarābādhīn 'alá tartīb al-'ilal*, 2. *Usool al-Trakeeb al-Adviā* (*Fi Adviā al-Musta'malā Inda al-Saidlā*), 3. *Kitāb Aghzia al-Marzā* (also known as *Risalā al-Aghzia wa al-Ashribā Li al-Marzā 'alá Tarteeb al-Ilal*)[12]. 4. *Risālā al-Aghzia wa al-Ashribā Li al-Asihhāa,* 5. *Risālā al-Adviā al-Mufrādā* (*Kitāb al-Mufrādāt Min al-Adviā*) (MS A 82, item 2).[43,80,81] The medical formulary of al-Samarqandi was published in Philadelphia in 1967.[82] The recipes are arranged according to the location of the complaint and classified illnesses from head to foot and endings with *theriacs* and antidotes for the bites of mad dogs and insects. There are numerous copies of the treatise preserved today under this name in various libraries.[80] A copy of *Khāmsā Najīb al-Dīn al-Samārqāndī* is preserved in *Darul Ulūm* Deoband Library (written in 1630).[43] Three copies of manuscripts are present in Library of University of California, Los Angeles.[76] Manuscript is also present in Jaipur (dated. 1835) and Aligarh, English translation with explanation made by Nūri Al-Khalīdī and Martan Lewi published from Philadelphia America in 1967.[43]

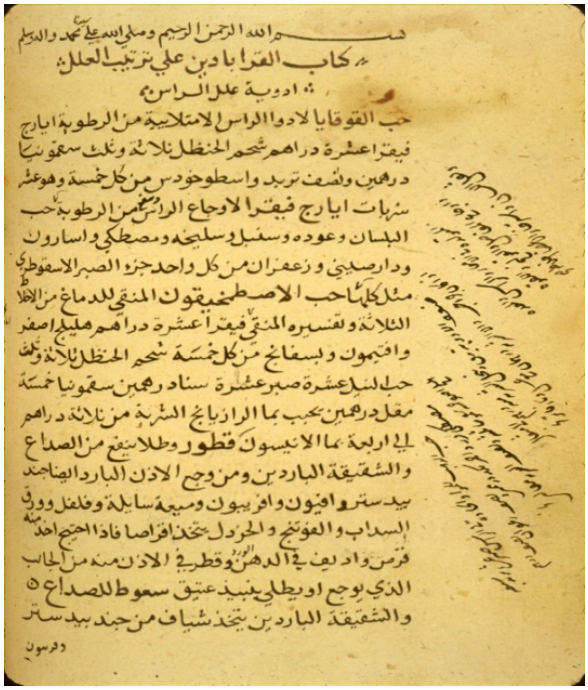

Figure 3: *Kitāb al-Qarābādhīn 'alá tartīb al-'ilal* by Najīb al-Dīn al-Samārqāndī (From National Library of Medicine USA)

Usūl al-Trākeeb al-Adviā **(Rules for compounding of Drugs)**

It is also known as *Usūl al-Tarākeeb* or *Kitāb al-Adviā al-Mūrākkābā wa Dustūrūha wa Qawānin-i-Istemālīhā* or *Risālā fi Usūl al-Tarākeeb* or *Usūl al-Tarākeeb fi Adviā al-Mustā'mālā Inda al-Saidlā*. The book was written by Abū Ḥamid Muḥammad ibn 'Alī ibn 'Umār Najīb al-Dīn al-Samārqāndī (d. 1222). It is divided into 19 chapters. Basically, this book gives rules and regulations for preparation of *Mūrākkābāt* (compound formulation). It is organized according to dosage forms. Weight, measurements, and some pots used during preparation of formulations are also described in it. The numerous copies of manuscript are preserved in various library, all over the world such as, *Khūdā Bakhsh* Library Patna (59,(2)4/58), Riza Library Rampur ((9)1/467), Jamia Hamdard, Darul Ulūm Deoband Library, Tonk, Zakhīrā of Hakim Aḥmād Hasān Jaipur, Khanqāh Mujibia Phulwari Shareef Patna

(last. dated 1546). Persian translation was made in India and preserved in Aasfiyā Hyderabad[43] now it is published in Arabic from Markāz Ihyā al-Turas al-Ilmi al-Arabi Baghdad in 1989.[83] The Urdu translation done by Hakim Abdul Bari Falahi and named (may be incorrect) as '*Qarābādhīn-e-Marīstānī*, and was published in New Delhi by the Department of AYUSH Government of India in 2006.[12]

Dustūr al-Bimāristān

It is also known as *Al-Dustūr Al-Bimāristāni fi al-Adviā al-Mūrākkābā* or *Dustūr al-Adviā al-Mūrākkābā* or *al-Dustūr al-Marīstān* or *al-Dustūr fi al-Tīb or al-Dustūr or Qarābādhīn-e-Sadīd*. It is written by Sadīd ad-din Abu al-Fāzl Dawūd Bin Albīyān Israīlī (1161-1295). It is the first book written on hospital pharmacy describing compound drugs for diseases. It consists of 12 chapters according to dosage forms.[84] The book has a good arrangement with definitions, word explorations and quotes of physicians. It also describes the period after that a formulation can be used. It is the base of *Minhāj al-Dukkān wa Dustūrul al-Ayān.* It is a collection of only tested formulations and those are used in *Nasrī Shīfā khānā* in Cairo and apothecary shops in Egypt, Syria and Iraq. It was published with French and Arabic introduction in Egypt under supervision Alqīs Bolīs in 1933.[85]

Qarābādhīn Ibn Nafīs

It is written by Alāaldīn abu AlHassān Alī ibn AbiHāzm alQarshī al-Dimashqī (1213-1288), also known as Ibn alNafīs. The book consists of four chapters. The second chapter is related to *Qarābādhīn*. Only well-known and experienced formulations are mentioned such as decoction, confection and enema. The single drugs are described alphabetically. It is found in a manuscript form in Alpago's in 1547; probably not published till now. Publication named as *Libellus de removendis nocumentis, quae accident in regimime sanitatis*, is a Latin translation containing part of *Ibn alNafīs'* commentary on pharmacopeia.[86]

Minhāj al-Dukkān

This book is written by Abu al-Munā Dawūd ibn Abī Nāsr Ibn Huffāz al-Kuhen (Cohen) bin al-attār al-Israilī al-Harūnī, an author of 13th century (fl. 1260), and a Jewish druggist living and practicing in late Ayyūbid and early Mamlūk Cairo (1173-1309). Its full name is '*Mīnhāj al-Dukkān wa Dustūr al-A'Yān fi A'Māl wa Tarākib al-Adviā al-Nafi'a li-al-Insan'*. The work is divided into

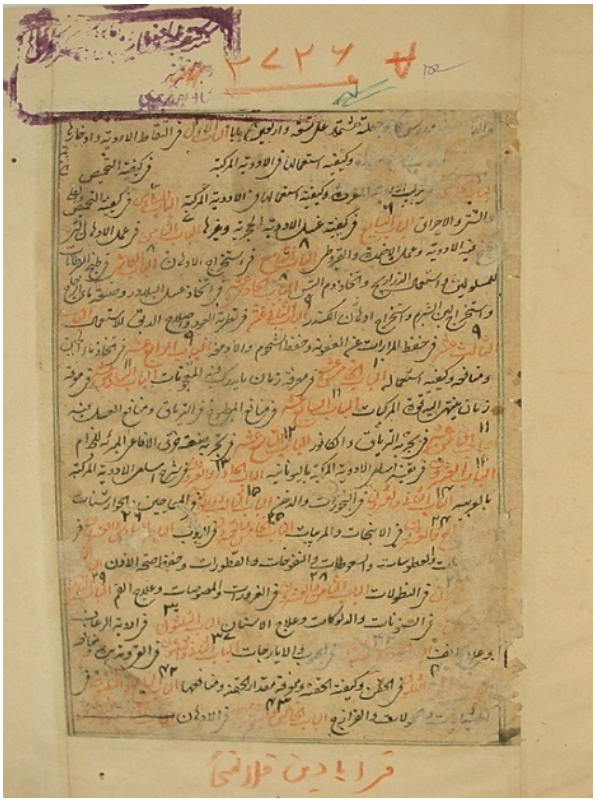

Figure 4: *Aqrābādhīn al-Qalānīsī* by Ibnūl Qalānīsī (From Government Nizamia Tibbi College, Hyderabad, India)

25 *Abwāb* (chapters), a full table in the preface containing instruction for the pharmacist / formulator, preparation of syrup along with methods of correction if any defect occurs during preparation, *Ashkāl-e-Adviā* (dosage forms), substitutes of drugs, description of single drugs, weights and measurements, pharmaceutical ethics, preparation and storage, examination and standardization of single and compound drugs and its contraindications. It was written / compiled on pharmaceutical aspects in *Mamlūk* Cairo in 1260. Numerous copies of the manuscript are preserved in various libraries all over the world. It was published by *Dar Al-Kutūb Al-Arabia Al-Kūbrā* Cairo in 1904, and Arabic manuscript (MS:615: A88:v.2) is preserved in American University of Beirut.[87] It is now published by Ghaemiyeh Computer Research Institute of Isfahan in 1996.[88]

Aqrābādhīn al-Qalānīsī

It is also known as *Zikrūl Awzān* or *Kūnnāsh Ibnūl Qalānīsī* (Figure 4), written by Badrūddīn Mohammad bin Bahrām bin Mohammad al-Qalānīsī al-Samārqāndī (14th century). It consists of 49 chapters, and contains all types of compound formulations in detail with references, mostly are taken from *al-Qanūn, al-Hawī, al-Mansūrī, al-Zakhīrā*, and *al-Kifāyā*. Author also adds a

special chapter for the recipes of known *A'alīm Qawāmūddīn Sā'id Mihānī* and *Imām Shārfūddīn Mabārsāmī*.[61] Many manuscripts such as –'WMS. Or.65 and WMS. Or.102' can be found in Welcome Library (UK),[58] British Museum (Suppl., No.796), Berlin Library (No.6498), Khūdā Bakhsh Library (Arabic Catalouge Vol.4, No.104, dated 1380 AD) and in Rampur (Nos. 190-2, p.492).[43,77]

Bughyā al-Muhtāj fi al-Mujārrāb min al-Ilāj

It is written by Dawud Ibn 'Umār al-Antākī or David of Antioch (d.1599). He was a blind Syrian physician and dynamic pharmacist in Cairo. This book is in Arabic language, consists of *Muqāddīmāh* (introduction) for description of *Tībb*; 22 *Abwāb* (chapters) and *Khātīmāh* (conclusion). Most of the chapters are related to diseases and its treatments from head to toe. The 20th chapter of the book is related to *Qarābādhīn* consisting seven sub-chapters. The *Khātīmāh* also contains seven chapters related to single drugs and *Qarābādhīn*. First chapter of *Khātīmā* is related to drugs were not mentioned in any books till that time e.g., *Khashāb al-Anbīyā, Chobchini, Yasmin Barrī* etc. The manuscript (No. 16 *Tībb-e-Taimur*) is preserved in *Dar al-Kutūb al-Misrīyā* Cairo. Now this book was published from Ghaemiyeh Computer Research Institute of Isfahan in 1968.[89] (Some other Qarābādhīn are mentioned in Table 1)

Table 1: Some other Qarābādhīn in chronological order

S. No	Name of *Qarābādhīn*	Name of author and year / period	Its regulatory status and other information
1	*Qarābādhīn al-Matrutidusi*	*Andromachus the Elder* (fl.54-68)	It is also known as '*Theriaca Andromachi'* that consist of 54 ingredients and beneficial in snakebite and scorpion bite, is dedicated to Nero (fl.54-68).[42]
2	*Kitāb al-Kūnnāsh fi al-Tībb*	Paulus Aegineta (625-690) *popular as al-Qawwabilly*	This book is famous as Kūnnāsh al-Surayya.[39]
3	*Qarābādhīn-e- Akhlat*	*Shabur*	This book was a collection of compound formulation specially syrup.[39]
4	*Kūnnāsh Sāghīr*	*Philagrius of Epirus* (4th century AD)	It is related to general diseases; *Rāzī* had quoted it as a reference book in *Kitāb al-Hawī*.[40]
5	*Kitāb fi Tarkib al-Adviā*	*Sarjius Ras Aini* (d.536)	Rāzī had quoted it as a reference book in *Kitāb al-Hawī*.[40]
6	*Medical Compendium in Seven Books*	*Paul of Aegina a.k.a. Paulus Aegineta.* (7th century)	Written in Greek.[36]
7	*Zakhīrā Al-Iskandar Al-Malik Bin Faiqalas Zi Al-Qarnain*	*Author unknown Translated in Arabic by order of Al-Mu'tasim* (833)	It was in *Umudia* City written in Unani /Romi language in golden plates with description of preparation of Samoom (Poisons), Tiryaqat (Antidotes) and Iksiraat. One copy of Arabic translation was found in Hyderabad dated 1438 with 23 pictures.[44]
8	*Kūnnāsh Masarjoweh (Māsarĝawai al-Basrī)*	*Masarjoweh* (*Māsarĝawai al-Basrī*) (7th century)	Basic Kūnnāsh of Ahron al- Qiss translated from Syrian language.[38,44]
9	*Qarābādhīn*	*Jurjis Unani* (7th century)	He was principal of Academy of Gondishapur. The *Qarābādhīn* was translated into Arabic by Hunain ibn Ishāq.[44]
10	*Kūnnāsh Tiyazuq*	*Tiyazuq (Theodores* d. About 708)	Details of treatment was mentioned.[40,43]
11	*Qarābādhīn Mesu Khurd (Mesue the Elder)*	*Mesu Khurd* (*Mesue the Elder)* (8th century)	Mesue the Elder was an Assyrian Nestorian Christian physician. It was recommended as a book of pharmacy for four centuries, was translated in Latin and known as foundation of Europe's Govt. Pharmacopoeia.[50]
12	*Al-Kūnnāsh*	*Jirjis ibn Jibril* (fl.765)	It is the first book translated into Arabic, most of the Unani books quoted it.[40]
13	*Kitāb al-Kūnnāsh*	*Jurjis ibn Bukhtishu* (d.769)	Valuable book[39]
14	*Kūnnāsh al-Mushajjar al-Kabir*	*Yuhanna ibn Masawaih* (777–857) (*Mesu Buzurg*)	Very valuable book.[39] The manuscript is preserved in Riza Library Rampur and Khūdā Bakhsh Library Patna (No. 2167).[40] and one another manuscript is in Maktaba Barakat Aḥmād Tonk (dated. 597)[42]
15	*Al-Kūnnāsh al-Kabir*	*Abul Hasān Isa ibn al-Hakam* (known as *Masih Dimashqi*) (fl.786-809)	It is very important Kūnnāsh for drugs and treatments. It was written in early period of Arabian medicine. Rāzī quote this book in al-*Hawī* with name of 'Masih'. He works as Tabib in the period of Harun al-Rashid (reign 786-809).[43]

16	*Kūnnāsh al-Kabir*	*Jabril ibn Bukhtishu* (d. 801)	The manuscript is preserved in Kütahya library of Wahid Pasha in Turkey.[40]
17	*Kitāb al-Kūnnāsh al-Kabir*	*Yuhanna ibn Sarafyun* (In early period of Abbasid Khalifat 9th century)	Known in Europe as Johannes Serapion, and commonly called Serapion the Elder. It was in Syrian language and translated into Arabic. It consists of 12 chapters.[39,43]
18	*Kitāb al-Kūnnāsh al-Sāghīr*	*Yuhanna ibn Sarafiyun* (In early period of Abbasid Khalifat 9th century)	It was in Syrian language and translated into Arabic by Dadisi Katīb in 930. It was also translated in Arabic by *Hasān* bin Bahlol Awani Tabrahani and Abul Bashar Matta. It consists of 7 chapters[39,43]
19	*Kūnnāsh al-Hadhara*	*Abu al-Hasān Alī ibn Sahl Rabbān al-Tabārī* (838–870)	Valuable text[40]
20	*Kitāb Kūnnāsh al-Khaff*	*Abū Yaʿqūb Isḥāq ibn Ḥunayn* (830-910-1)	Important text[39]
21	*Qarabadeen Ibn Abd Rabbihi*	*Ibn Abd Rabbihi* (860-940)	Important text[61]
22	*Kūnnāsh al-Mansuri*	*Zakārīyā Rāzī* (865-925)	It is also known as Kitāb al-Mansuri and al-*Tībb* al-Mansuri. It is dedicated to Ishāq ibn Aḥmād bin Asad, Ruler of Ray (reign 902-908 AD). It is translated many times into Latin between 1480 to 1489 AD, and Urdu translation was published by CCRUM in 1991.[42]
23	*Kitāb al-Qarābādhīn*	*Zakārīyā Rāzī* (865-925)	Very important text[38,39]
24	*Kitāb Fi Asqal Al-Adviā Al-Mūrākkābā*	*Zakārīyā Rāzī* (865-925)	Very important text[38]
25	*Taleeq Wa Mujarrabat*	*Afraeem Bin zafan*	Important text[61]
26	*Kitāb al-Aqrābādhīn*	*Ishāq ibn Imram al-Baghdadi* (d.907 AD) (In the period of Khalifa Mo'tamad (Fl. 870-892)	Important text [40]
27	*Kūnnāsh Yahya ibn Ishāq*	*Yahya ibn Ishāq* (fl. 929-961)	It consist of 5 big volumes. He compiled the treatment of ruler Nasir Abd-ar-Rahman III (Reign 929-961AD) in it. It is very valuable and authentic Kūnnāsh.[42]
28	*Kūnnāsh fi al-Tībb*	*Nastat al-Nasrani* (fl. 942)	It is a very good book[39]
29	*Qarabadeen Musa*	*Musa Ibn Aazaar* (d.974)	Important text [61]
30	*Mujarrabaat Fi Al-Tīb*	*Ibn Al-Jāzzār* (895-979)	Authentic Qarabadeen[61]
31	*Kitāb Usūl Al-Tarakeeb Fi Al-Tīb*	*Mohammad Bin Aḥmād Bin Abu Nasr Khajandi* (940 -1000)	Also named as Abu Mahmud Hamid ibn Khidr Khojandi (known as Abu Mahmood Khojandi, Alkhujandi or al-Khujandi) [43]
32	*Al-Aqrābādhīn*	*Abu Alī Husain bin Abdullah bin Hasān bin Alī Sīnā* (980-1037)	The copy of manuscript is preserved in Khazina Library Istanbul.[43]
33	*Kūnnāsh Daud Bin Hunain*	*Daud Bin Hunain* (10th century)	A famous Kūnnāsh[42]
34	*Kūnnāsh Ibn Mandaweh*	*Abu Alī Bin Ahmed Bin Mandaweh Alasfahani* (died in 1019)	Very important text[61]
35	*Kūnnāsh Ibn al-Butlan (Almaghalat al-Mokhtarat fi tadbir al-amraz al-a'rezat al-aksar bel taghziat Ma'loofat)*	*Ibn Butlan* (1038/1075)	Manuscript is present in Welcome Library, UK[90,91]
36	*Kūnnāsh al-Ruhban wa al-Adyerah*	*Ibn Butlan* (1038/1075)	Written for priest[40]
37	*Al-Maqala al-Aminiyya fil-Adviā al-Bimāristānia*	*Ibn Tilmīdh* (1073-1165)	A treatise on hospital drug, the manuscript is found in Welcome Library, UK[58]
38	*Qarabadeen Mukhtasar lil-Bimāristān*	*Ibn Tilmīdh* (1073-1165)	Includes 13 chapters[38]
39	*Khazain Al-Hikam*	Written by group of *Atibba* (*Physicians*)in the period of *Khalifa Abul Qasim al-Muqtadi bi-amr Allah* (1075-1094)	This manuscript dated 1376, contains 100 pages with writing of Masud Bin Mahmood Bin Mohammad Al-Tabeeb, It is a registered and referential book[44]

40	*Kitāb Qarābādhīn*	*Abul-Barakat Hibat Allah ibn Malka al-Baghdadi* (1080 – 1164 or 1165)	Contains 3 Maqalat (chapters)[38]
41	*Mujarrabaat Fi Al-Tīb*	*Ibn Ain zarbi* (d.1153)	Important text[61]
42	*Qarabadeen Al-Khail*	*Muhammad Bin Khalifa Al-Yaqoob* (1153)	Important text[43]
43	*Kitāb Al-Mukhtarat Fi Al-Tīb*	*Ibn Hubal Baghdadi* (1121-1213)	Completed in 1164. Manuscripts are present in various libraries. Volume II-last Fusūl (partition) is related to compound formulations. The Arabic edition in two volumes was published from Dairatil Ma'rif al-Uthmania Hyderabad India in 1943.[56] Urdu translation is published by CCRUM New Delhi in 2005.
44	*Kūnnāsh fi al-Tībb*	*Muwaffaq al-Din Muhammad Abd al-Latif ibn Yusuf al-Baghdadi* (1162–1231)	A valuable Kūnnāsh[40]
45	*Kitāb Al-Qarābādhīn Al-Sagheer*	*Najeeb Al-Deen Samarqandī* (d. 1222)	A copy is present in Darul Uloom Deoband Library (written in 1630)[43]
46	*Taqweem Al-Adviā*	*Fakhruddin Muhammad Alī Asfaraini Neshapuri* (d. 1358)	Manuscript is found in Tonk (oldest dated 1495AD), Moulana Azad Library Aligarh, State Central Library Hyderabad, Riza Library & Jamia Hamdard Delhi India. It is written in a tabulated form and its 2nd chapter is related to Adviā **Mūrākkābā.**[43]
47	*Jirab al-Mujarabat/al-Tajarib*	*Abu Abdullah Mohammad bin Yahya Abi Talib bin Yahya* (1630)	Contains 30 chapters and collections of well-tried receipts.[58]
48	*Kitāb Al-Aqrābādhīn (Qarābādhīn Kabeer)*	*Mohammad Bin Mujalla Bin Saegh Jazri (Antari)*	Important text. It is a complete collection of Mūrākkābāt (Formulations).[84]

Discussion and conclusion

As mentioned in our review, the status of *Qarābādhīn* become gradually important starts from the Antiquity. Earliest *Qarābādhīn* was known in *Sumerian* history and *Egyptian Papyri*. Although Hippocrates (c.460-370 BC) gave tremendous contributions to medicine and pharmacy, Dioscorides (40-90) is accepted as the biggest pharmacopeian in his time and considered to be precursor to all modern pharmacopoeias.[35] Galen (130-200) also authored 129 books, including exclusive *Qarābādhīn* material named as *De Simplicium Medicamentum* "*Kitāb Al-Adviā Al-Mufradā*" and *'Kitāb ila Aglooqan fi Shifa al Amraz'* which is a masterpiece of Galen in the field of *Qarābādhīn* that was translated into Arabic by *Hunayn ibn Ishāq* (809-873).[27]

Paul of Aegina's (625-690) *Kitāb al-Kūnnāsh fi al-Tīb* was the last book written in Greek language. The book became a standard text throughout the Islamic world for the next 800 years. It was the complete encyclopedia of medical knowledge at that time.[36] The first academic book in Arabic is *Kūnnāsh Ahron* written in *Suryani* language by Ahron Bin A'yun Al-Qiss in 600. It was one of the best old *Kūnnāshs*. It was published in 709 by Umar Bin Abdul Aziz (Reign 717-720 AD) after 40 days continuous *Istikharah* (A religious consultation from Allah/ God) and he also distributed it in his territory.[43,44]

In the Medieval Islamic period, various authentic and referential *Qarābādhīn* were authored with systemic and scientific approaches. Caliphates gave attention to this kind of intellectual activities. The first *Qarābādhīn* in Arabic period was written by Yuhanna Bin Maswaih, patronized by Caliphat Harun al-Rashid (reign 786-809). *Aqrābādhīn* by Sābūr ibn Sahl (d.869) was believed to be first *Qarābādhīn* which is descriptive and acceptable by government authority. This text enjoyed immense popularity until it was superseded by Ibn al-Tilmīdh's version, later in the first half of twelfth century. *Qarābādhīn Yāqūb al-Kīndī* was a very important *Qarābādhīn* in this context which was written on the basis of official *Qarābādhīn*.[46] Ibn Sina's great book *Al-Qanūn fi'l-Tībb* has translations in 87 languages in Europe, mostly in *Latin, Germen* and *Hebrew* which shows its acceptance, resonation and popularity. *Al-Aqrābādhīn al-Kabir* by ibn al-Timidh (1073–1165) is a *Qarābādhīn* which became the standard pharmacological work in the hospitals of the Islamic civilization, superseding an earlier work by Sābūr ibn Sahl. It was based on a number of formularies and abridged by Ibn al-Tilmīdh for

use in the '*Adudi* hospital in *Baghdad*. *Minhāj al-bayan* by Ibn Jazlah Al Baghdadi (d.1100) is an Arabic handbook of pharmaceutics covers not only medicinal simples (Materia medica) but also compound remedies. It was dedicated to the 'Abbasid caliph al-Muqtadi who ruled from 1075 to 1094. *Dustūr al-Bimāristān* by Sadid ad-din Abu al-Fazl Dawood Bin Albiyan Israeli (1161-1295) was written on hospital pharmacy, describing compound drugs for diseases.

In conclusion, these findings of the review give information and indicate the significance and regulatory status of *Qarābādhīn* in Medieval Islamic era. It can help to explore *Qarābādhīn* and related publications of Medieval Islamic period which gives foundations for the present-day pharmacopeias. Since these documents also take into account ethical considerations, its utility in the fields of medicine and medical ethics should be investigated.[27]

Acknowledgment: The authors thank Director of National Institute of Unani Medicine (NIUM) Bangalore, for providing all the essential assistant and motivation, and Juma Al-Majid Centre for Culture & Heritage, Dubai - U.A.E. for images / figure contribution made from the recourse of Government Nizamia Tibbi College Charminar Hyderabad India.

Conflict of interest: There is no conflict of interest.

Funding statement: This study did not receive any funding.

Authors' contributions: Dr Akhtar Ali and Dr Hamiduddin designed the work, conducted the work, collected and compiled literature and analysed the data. Akhtar Ali done translation from Arabic to English, Hamiduddin corrected the translation, drafted the manuscript and also revised it critically. All authors agree to be accountable for all aspects of the work.

References

1. Qi Z, Kelley E. The WHO traditional medicine strategy 2014–2023: A perspective. Science. 2014;346 (6216):5-6.
2. Anonymous. Unani System of medicine the Science of Health and Healing. Department of AYUSH Ministry of Health & Family Welfare, Government of India New Delhi; 2013:1 https://ccrum.res.in/writereaddata/UploadFile/Dossier_1325.pdf. Accessed 04.07. 2021.
3. Speziale F. The relation between Galenic medicine and Sufism in India during the Delhi and Deccan Sultanates. East and West. 2003;53(1/4):149-78.
4. Center ME. Mamlūk Studies Review XVI. Middle East Documentation Center (Medoc). The University of Chicago.2012:179.
5. Abolhassanzadeh Z, Mohagheghzadeh MMZA, Introduction of qarabadhin manzoom fi tibb as a pharmacological literature in verse, In: Nil SARI Uzm., Burhan AKGÜN (eds.) et.al. 5th International Congress of the International Society for the History of Islamic Medicine. 25-28 October, 2010, Istanbul-TÜRKİYE. www.ishim.net /Articles / 2010, Abstracts. pdf. Accessed 04.07. 2021.
6. Ullmann M. Die Medizin im Islam, Handbuch der Orientalistik, Abteilung I, Ergänzungsband vi, Abschnitt 1. Leiden: E.J. Brill, 1970:112–115.
7. al-Nakri AA. Durdur Al-Ulama aw Jamiul Uloom fi Istlihat Al-Funoon. 1st ed. Lebanon, Darul Kutub Al-Ilmia Vol. III, 2000: 49.
8. Ibn Qayyim J. Zadul Ma'ad fi Hadye Kairil Ibad. 27th ed. Kuwait, Maktaba al-Manar al-Islamia Vol.IV, 1994:10.
9. Jilani G. Makhzanul Jawahir. NM ed. New Delhi, Idara Kitāb Al-Shifa, 2013:658.
10. Arnbar R. Dustoorul Ulama Aw Jamiul Uloom Fi Istilahatil Funoon. I ed. Lebanon/Beirut, Darul Kutub Al-Ilmia, 2000.
11. Dehlavi SA. Farhange Aasfiya. 1st ed. Lahor, Vol.III, Islamia Press, 1898:377.
12. Samarqandī MBA. Qarābādhīn Marīstānī. 1st ed. New Delhi: Dept. of AYUSH Gov. of India; 2006:11.
13. Khansahab GJ. Makhzan-ul-jawahar (Tībbi doctory Lughat), Merchentile press, Tībbi kutub Khana lahor, 1923:658.
14. Kashmiri MAS. Faizul Bari Ala SahihiAl-Bukhari, Vol. I. Maktaba Mishkatul Islamia, YNM: 327.
15. The Book of Wealth and Wishes. https://www.wdl.Org /en/item/17149/. (Last updated 16 June 2016). Accessed 04.07.2021.
16. Anonymous. Al-Fehrisul Mauzui Li Majalla al-Lugha al-Arabia. Vol. 2. Al-Maktaba al-Shamila; 97.
17. Firozabadi MY. Al_Qamoos al-Muheet. Vol. I, YNM:780 (Maktaba al-Shamila).
18. al-Kafi TS. Al-Miheet fi al_Lughah Vol. VI. Lebanon, Alam al-Kutub, 1994:166.
19. Mustafa I, al-Zayat A, A.Qadir H, al-Najjar M. Al-Mo'jam al-Waseet, Dar al-Da'wah, vol. II, YNM: 800.
20. al-Husaini ZMM. Taj al-Uroos min Jawhir al-Qamoos, Dar al-Hidayah, Vol. 17, YNM:369.
21. Kūnnāsh. https://Kūnnāsh.wordpress.com. Accessed 04.07.2021.
22. Satoskar RS, Bhandarkar SD, Rege NN, Pharmacology and Pharmacotherapeutics (Nineteenth edition), Popular Prakashan, Mumbai, 2005:3.
23. Definition of pharmacopoeia https://www.merriam-

webster. Com / dictionary/pharmacopoeia. Accessed 04.07.2021.

24. Pharmacopoeia, Medical Treatise. https://www .britannica.com/topic/pharmacopoeia. Accessed 04.07.2021.
25. Wieniawski W. Role and functions of the International Pharmacopoeia. Annali dell'Istituto superiore di sanità, 1974;11(3-4):204-10.
26. Soldi A. Pharmacopoeia as quality codex for the manufacturers. Annali dell'Istituto superiore di sanità, 1974;11(3-4):269-280.
27. Shahabuddin, Ghani U, Hannan A. Unani Medicine: Comparative Study of Unani Qarābādhīn (Pharmacopeia) and clinical evaluation of some herbal medicine for Amoebiasis. 1st ed. Not Mentioned: VDM Verlag Dr.Muller; 2011:17.
28. Encyclopaedia Britannica; or A Dictionary of Arts, Sciences, Miscellaneous Literature, Volume 12:686. https://books.google.co.in/books, encyclopaedia Britannica. Accessed 04.07.2021.
29. Rooney A. The History of Medicine. The Rosen Publishing Group. 2012:121.
30. Anonymous. Dioscorides De Materia Medica. Johannesburg, IBIDIS Press cc, 2000.
31. Dispensatory. http://www.yourdictionary.com/ dispensatory, Accessed 04.07.2021.
32. Anonymous. Qarabadhin Hamdard, Hamdard Dawakhana wakf Delhi (YNM): 5.
33. Usmanghani K. Unani Medicine: Implications and Applications, www.hamdard.com.pk. Accessed 04.07.2021.
34. Ramzan I. Phytotherapies: Efficacy, Safety, and Regulation, John Wiley & Sons, 2015:158.
35. Troy DB. Remington the Science and Practice of Pharmacy. 21st ed. Troy DB, editor. Noida, B.I. Publications Pvt. Ltd, 2006.
36. Smith W. A new classical dictionary of Greek and Roman biography, mythology and geography: Partly based upon the dictionary of Greek and Roman biography and mythology.Vol. III, Harper; 1881:152-3.
37. Scarborough J, Nutton V. The Preface of Dioscorides' Materia Medica: introduction, translation, and commentary. Transactions & studies of the College of Physicians of Philadelphia. 1982;4(3):187.
38. Usiba' IA. Uyun Al-Anba Fi Tabaqat Al-ATībba. Vol. I. (Urdu translation) 1st Ed. New Delhi, CCRUM, 1990:193,302,346-365,585,308,588,506.
39. Qutfi J. Tarikh Al-Hukama. (Urdu translation) 1st Ed. New Delhi, CCRUM, 2012:142,136,305,488,258,332, 366,240,505,506,135,383,449.
40. Nigrami HSMH. Tareekhe Tībb. 4th Ed. New Delhi: NCPUL; 2004:240, 224, 266, 351, 262, 317, 296, 250, 213, 249, 254, 338, 320, 328.
41. Dear P. Revolutionizing the sciences: European knowledge and its ambitions, 1500-1700. Palgrave Macmillan; 2008: 236-257.
42. Juljul I. Tabaqat Al-ATībba Wa Al-Hukama (Urdu translation by Hakim Abdul Bari Falahi). 1st ed. Delhi, Bharat Offset, 2012:165,127,180,192,218,183.
43. Al-Rahman SZ. Aainae Tareekhe Tībb. 1st ed. Aligarh, Publication Division AMU Aligarh, 2001: 63,153,156,136,150,151,155,237, 238, 249, 88, 86, 250, 135, 292.
44. Qazi IM. Islami Tībb. 2nd ed. Hyderabad, Maktaba Ainul Uloom, 1999: 8, 10-12, 28-37, 105.
45. Gutas D. Greek Thought, Arabic Culture: The Graeco-Arabic Translation Movement in Baghdad and Early'Abbasaid Society (2nd-4th/5th-10th c.). Routledge; 2012:8-9.
46. Al-Zarkalī KM. Al-I'lam. Vol.VIII. 5th ed. Darul Ilm Lil Malaeen, 2002:195.
47. Beeston AFL. Arabic Literature to the End of the Umayyad Period. New York, Cambridge University Press, 1983:501.
48. al-Bitriq Y. https://www.nlm.nih.gov/hmd/arabic / bioY .html. Accessed 04.07.2021.
49. Glick TF. Medieval science, technology, and medicine: An encyclopedia. Routledge; 2014.
50. Akbarabadi MM. Fehrist Qarabadeen Ma'dane Tajurbat. 1st ed. Patna, Khuda Baksh Oriental Library, 1998:7.
51. Elgood C. A medical history of Persia and the Eastern Caliphate: From the earliest times until the year AD 1932. Cambridge University Press; 2010:167.
52. Virk Z. Muslim Contribution to Pharmacy. https:// karachi.academia.edu/ZakārīāVirk. Accessed 04.07.2021.
53. Oliver K. Sābūr Ibn Sahl the Small Dispensatory. Printed in the Netherlands, Brill Leiden. Boston, 2003.
54. Johnson DA. Syriac Pearls. Lulu.com. USA, 2017:46.
55. Meyerhof M. Alî at-Tabarî's``Paradise of Wisdom'', one of the oldest Arabic Compendiums of Medicine. Isis. 1931 Jul 1; 16(1): 6-54.
56. Qadeer A. Tībbi Sahaef. 1st ed. New Delhi, Education Publishing House, Delhi, 2004:41-100.
57. Virk Z. The Arab Galen Abu Bakr Zakārīyā Al-Rāzī. https://karachi.academia.edu/ZakārīāVirk. Accessed 04.07.2021.
58. Iskandar AZ. A Catalogue of Arabic Manuscripts on Medicine and Science in the Welcome Historical Medical Library, London: The Welcome Historical Medical Library, 1967:78-129.
59. Ibn Jabrīl B. Khawās al-Ashyā. Ghaemiyeh Computer Research Institute of Isfahan. YNM. http://www. ghaemiyeh.com. Accessed 04.07.2021.
60. al-Kashkari Y. Kūnnāsh fi al-Tībb. Isfahan Ghaemiyeh Computer Research Institute of Isfahan; 1996. http:// www.ghaemiyeh.com. Accessed 04.07.2021.x

61. Usiba' IA. Uyun Al-Anba Fi Tabaqat Al-Atibba. Vol. II, (Urdu translation), 1st Ed. New Delhi, CCRUM, 1992:69-253.

62. Rahman Z. Qanun Ibn Sina aur Uske Shariheen wa Mutarjimeen. 1st ed. Aligarh, Publication Devision Muslim University Aligarh, 1986:31.

63. Browne EG. Tibb al-Arab. (Urdu translation) I Ed. New Delhi, CCRUM, 2010:88

64. Majusi ABA. Kamil Al-Sana'h. (Urdu translation) 1st Ed. New Delhi, CCRUM, 2010.

65. Kitāb alAqrābādhīn. https://www.nlm.nih.gov/hmd/arabic/ welcome.html. Accessed 04.07.2021.

66. Karmi G. A mediaeval compendium of Arabic medicine: Abu Sahl al-Masihi's" Book of the Hundred.". Journal for the history of Arabic science. 1978;2(2):270-90.

67. Al-Masīhī As'iy. Kitāb al- Mi'a fi al-Tībb (Urdu Translation). 1st Ed. New Delhi, CCRUM, 2008.

68. Al-Bairuni AR. Al-Saidana Fi Al-Tīb. I ed. Tehran, Farhangistan Zaban wa Adab Farsi, 1383.

69. Sina AAI. Al-qanun fi Al-Tib (Urdu Translation) New Delhi, Idara Kitab Al-Shifa, YNM.

70. Ibn Rizwan. Kitāb al-Kifāyā fi al-Tīb. Isfahan, Ghaemiyeh Computer Research Institute of Isfahan, 1966.

71. Chipman L. The World of Pharmacy and Pharmacists in Mamlūk Cairo. Brill; 2010:31-32.

72. Aqrābādhīn. https: // www.nlm.nih.gov /hmd / arabic/ welcome. html. Accessed 04.07.2021.

73. Minhāj al-bayān. https://www.nlm.nih.gov/ hmd/ Arabic/ welcome.html. Accessed 04.07.2021.

74. Campbell D. Arabian medicine and its influence on the Middle Ages. Routledge; 2013:82.

75. Ibn Jazlāh. Minhāj al-Bayān. Ghaemiyeh Computer Research Institute of Isfahan, 1972. http://www.ghaemiyeh.com. Accessed 04.07.2021.

76. Iskandar A Z. A descriptive list of Arabic manuscripts on medicine and science at the University of California, Los Angeles. Leiden, E.J. Brill, 1984:17-28.

77. Arabic Catalogue Vol.4. http://kblibrary.bih.nic.in/vol04.htm. Accessed 04.07.2021.

78. Qarābādhīn. https://www.nlm.nih.gov/hmd/arabic/ welcome .html. Accessed 04.07.2021.

79. Baghdadi IM. Hadiyatul Arifeen Asmaul Muallifeen wa Aasarul Musannifeen. Vol.II, 1st ed. Libnan, Daru Ihya Al-Turas al-Arabi Berut, 1951:110.

80. Kitāb al-Qarābādhīn 'alá tartīb al-'ilal. https://www.nlm. nih. gov / hmd/arabic/welcome.html. Accessed 04.07.2021.

81. Al-Samarqandī Najīb Al-Dīn Abū Hāmid Muḥammad Ibn 'Alī Ibn 'Umar. http://www.encyclopedia.com/doc/1G2-2830903829.html. Accessed 04.07.2021.

82. Virk Z. Golden Age of Islamic Medicine. https:// Karachi .academia.edu/ZakārīāVirk. Accessed 04.07.2021.

83. al-Samārqāndī ND. Usūl al-Trākeeb al-Adviā. Ihyā al-Turas al-Ilmi al-Arabi Baghdad, 1989. Available from: URL: http://www.ghaemiyeh.com.

84. Khalīfa H. Kashf Al-Zunoon an Asami Al-Kutub wa Al-Funoon. Vol. I. Baghdad, Maktaba Al-Musanna, 1941:753,628.

85. Israeli SDA. Al-Dustūr al-Bimāristāni. France, Imprimerie Institute France, 1933.

86. Ghalioungui P. Was Ibn al-Nafis unknown to the scholars of the European Renaissance?, Clio medica (Amsterdam, Netherlands). 1983;18(1-4):37.

87. Minhāj al-Dukkān. http://almashriq.hiof.no/ddc/projects/ jafet/manuscripts/index.html. Accessed 04.07.2021.

88. Al-Israeli. Minhāj al-Dukkān. Ghaemiyeh Computer Research Institute of Isfahan, 1996. http://www.ghaemiyeh.com. Accessed 04.07.2021.

89. Al-Antākī. Bughyā al-Muhtāj fi al-Mujārrāb min al-Ilāj. Ghaemiyeh Computer Research Institute of Isfahan, 1968. http://www.Ghaemiyeh .com. Accessed 04.07.2021.

90. Ibn Buṭlān. https://upclosed.com/people/ibn-butlan/. Accessed 04.07.2021.

91. Lewicka P. Food and foodways of medieval Cairenes: aspects of life in an Islamic metropolis of the eastern Mediterranean. Brill; 2011:552.