

Contributions of Ancient Arabian and Egyptian Scientists on Botany and Agriculture

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Abstracts

The modern Botany is based on the findings and thinking of the people of historical age. If no one knows the base and work of the previous on a subject, he or she could mere develop a new thought or findings. For, a civilization must know its past. Hence, the present work is a small effort to find out the contribution of ancient Arabian and Egyptian scientists in the field of Botany and Agriculture. Different scientists of different school of thought, correlating different streams of science being Botany as a main subject, are described in the present work.

There was a great scarcity of water and vegetation in the desert of Arabia. The people living there needed plants to feed their animals. They wandered in search of vegetation, and went wherever they could find it. This great importance of plants resulted in their becoming an important topic of Arabic literature.

The study of plants was chiefly made from medical and agricultural points of view. The Arabs already knew about the medical use of some herbs and shrubs ('*Aqaqir wa'l Hashā'ish*). At the advent of Islam when, in connection with preaching, *Jihad*, or some other purposes they came in contact with other peoples, they took interest not only in the names and uses of plants, but they became also interested in their cultivation. So they tried to know the matters relating to agriculture such as the methods of plantation and fertilization, the time suitable for sowing and harvesting, and the nature of the soil. They made correct observations on sexual differences between such plants as palms and hemsps. The plants were classified into those that grow from cuttings, those that grow from seeds and those that grow spontaneously.

The Ancient scientists' knowledge of applied botany and agriculture can be estimated by reading the accounts of gardens and crops cultivated in different parts of the Ancient scientist world, particularly those in Spain. At one time ancient Spain was proverbial in this respect. The Arabs introduced irrigation and agricultural methods there with the result that it was transformed into a garden.

Cotton, rice, sugarcane, asparagus, oranges, lemons and pomegranates were some of the plants and fruits brought from outside and cultivated in Spain. Through that country the Europeans became aware of the cultivation of many plants which they did not know before. The famous gardens of Persia, Spain and Morocco, with

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well planned arrangements of trees, shrubs and flowers, with their tilled floors, their rivulets and fountains of water, built with an aesthetic taste, establishing harmony between architecture and vegetation throws light on their interest in agriculture, gardening and love for flowers .

Since the Arabs did not know much about the art of agriculture, they turned towards other peoples including the Romans, Nabateans and Persians for learning it. They also translated their botanical works into Arabic.

There are many lexicographers, geographers, travellers and physicians who wrote on plants. One of them was *Abü Sa'id 'Abd al-Malik Ibn Quraib al-Asma'i*. He was a native of Basrah, and came to Baghdad during the reign of *Härun al- Rashid*. *Asma'i* was born in 739 and died in 831. He is the author of a number of works on different subjects. One of them is on plants and trees. In the preface of this book the author has provided a general discussion on plants. First of all he has mentioned various types of soils having different conditions regarding their capabilities for cultivation and vegetation. Then he has mentioned the trees, giving an account of their various stages of development. After that he has classified the plants, giving examples for each class. Finally, he has described those plants which grow in plains and deserts. He has mentioned 230 plants in all. (1)

Another lexicographer and grammarian who wrote on plants was *Ahmad Ibn Da'ud Ibn Wanand*, nicknamed *al-Dinawari*. He was also called *al- Ashshāb* (the herbalist). He was a trustworthy reporter, an expert botanist, astronomer and logician Who compiled a number of works on various subjects.

In his book on plants *al-Dinawari* described, after observing the plants in the places where they grew, all that he had discovered and also all that his predecessors had mentioned. He did not leave even the minute details. This book was considered to be a standard work on herbalism, medicine and lexicography at a time when no one could become a physician or herbalist unless he had thoroughly studied this book, and was examined in it. (2)

Al-Birüni (d.1048) made observation on plants. He discovered that flowers have 3, 4, 5, 6 or 18 petals, never 7 or 9. (3)

A physician *Māsarjwaih* also compiled a work on the properties of simple drugs mentioning their good and bad effects. He was a Syrian Jew who flourished during the reign of *Umar Ibn 'Abd al-'Aziz*, and translated for him and for the Caliph *Marwan* some Greek works into Arabic. He translated the second part of *Galen's* work on simple drugs, which consists of six discourses. The translation was corrected by *Hunain Ibn Ishaq*. (4)

The Ancient scientists attached more importance to the translation of *Dioscorides'* work than to other botanical works. The later writers based their works on it adding whatever they knew of plants and simple drugs. *Dioscorides* was a distinguished scientist and an authority on herbs. He was a native of Anazarbos, hence called *Ainzarbi*. He travelled extensively and made investigations on plants and

their properties. When he reached certain conclusions about the plants, he entered them into his book illustrating them with the pictures representing the colours of plants. The book of Dioscorides consists of five discourses. Two more discourses on the animal poisons are ascribed to him. Thus the total number of discourses is seven.

The first discourse deals with sweet smelling drugs. The second consists of the description of vegetables and animals and their fluids. The third discourse discusses the roots of plants, the thorny plants and similar topics. The fourth deals with the drugs which are cold in nature, those which are warm, and those which cause relief from poisonous effects. The fifth discourse mentions different kinds of drinks and mineral drugs. (5)

One of the most important Ancient scientist botanists was *Abu'l-Mansur Rashid al-Din Abu'l-Fadl Ibn Ali al-Siiri*. He was the greatest authority on simple drugs, the variety of their names, their properties and uses. He was born in 1177 at the city of Sur in Syria, and was brought up there. Later he came to Baghdad where he started the study of medicine from *Shaikh Muwaffaq al-Din Abd al-Latif al-Baghdadi*. *Al-Suri* spent two years in Quds, at the hospital of the city where he practiced medicine.

Al-Siiri went to the places where the plants could be found, like the hills of Lebanon and other places which were famous for one or the other plant. He used to take with him a painter having different kinds of colours and paints. He observed the plants and showed them to his painter. The painter noticed the colour and roots of the plants, the size of their leaves and branches, and made the pictures accordingly. *Al-Suri* showed the plants to the painter at the time of their growth, maturity and withering. The painter prepared the pictures of the plants at every stage of their development, and filled in them the colours which he observed at that time. *Al-Suri* included these illustrations in his book on simple drugs and plants. He collected in it the material that he found in the books of the ancients, and also mentioned the drugs which he had discovered himself and their use which he came to know. *Al-Suri* served *al-Malik al-Adil Abu Bakr Ibn Ayyub* as a physician in 1215, and accompanied him from Quds to the Egyptian lands. After the death of *al-Malik al-Adil*, he served his son, *al-Malik al-Mu'azzam 'Isa Ibn Abi Bakr*. After the latter's death, *al-Suri* served his son, *al-Malik al-Nasir Da'ud Ibn al-Malik al-Mu'azzam*. He was made the chief physician. *Al-Suri* died in 1241 in Damascus. (6)

Another illustrious scholar and a distinguished botanist was *Abu Ja'far Ahmad Ibn Muhammad Ibn Ahmad Ibn Sayyid al-Ghafiqi* (d. 1165). As compared with others, he had a greater knowledge of the properties, uses and names of the simple drugs. His book on this subject is a valuable source of information. The author described briefly what Dioscorides and Galen wrote on this subject. He also mentioned what the later writers contributed to this branch of science. Thus his book consists of the accounts of simple drugs given by those who are learned in this field. (7)

One of the most important Ancient scientist botanists was *Abu Muhammad 'Abd Allah Ibn Ahmad al-Māliqi al-Nabāti*, known as *Ibn al-Baitār*. He was the greatest expert of his time in identifying the plants. He conducted research on the plants, and acquired a good knowledge of the names of the plants and their species and the places where they grew. He travelled in the Roman lands (Asia Minor) and some other territories and observed the plants in the places where they grew. There he also met some botanists, and learnt from them about many plants. He also met some well known botanists in the Maghrib and other places.

Ibn al-Baitar was in the service of *al-Malik al-Kamil Muhammad Ibn Abi Bakr Ibn Ayyüb*. He was considered to be an authority on simple drugs and shrubs, and was appointed in Egypt as the chief of physicians and apothecaries. He remained in his service until his death. Then he was honoured by his son *al-Malik al-Salih Najm al-Din Ayyilb*. He died in Damascus in 1048. *Al-Baitār* is the author of many works on simple drugs and other subjects. One of them is the *Kitab al-Jami' fi'l-Adwiyyah al-Mufradah*. This book is chiefly based on the works of his Greek and Ancient scientist predecessors, but also contains his personal observations made in different lands. The opinions of the later scholars about mineral, animal and plant drugs have also been quoted in the book. The author gave in alphabetical order the Persian, Latin and Berber names of the simple drugs and also cleared the confusions in the names. He also mentioned their properties and uses. This book is the best Arabic work on this subject. It was written for *Al-Malik al-Salih Najm al-Din Ayyüb Ibn al-Malik al-Kāmil*. It was translated into French and German. (8)

Another famous scholar and botanist of Spain was *Abu'l-Abbas Ahmed Ibn Muhammad Ibn Mufarraj Ibn Abi'l-khatib* known as *Ibn al-Rumiyah*. He was a native of Seville. In 1216 he went to Egypt. He lived for two years in Egypt, Syria and Iraq where the people learnt something from him. In these lands he observed many plants which were not found in his native land. He observed the plants in the places where they grew. When he reached Alexandria the Sultan *al-Malik al-'Adil Abü Bakr Ibn Ayyub* heard about his scholarship and his deep knowledge of plants. The Sultan called him to his court and honoured him. He stayed with him for sometime, and then returned to Spain.

Ibn al-Rümiyah was a well-known scholar, researcher on medicine, the author of many works and fond of collecting books. One of his writings is a commentary on Dioscorides' book dealing with simple drugs. He also wrote a travelogue at the end of his travels in the Eastern land entitled *Al-Rihlat al-Mashriqiyyah*. It is a collection of his discussions and observation made particularly on the coasts of the Mediterranean. (9)

The last famous writer on agriculture in Spain was *Abü Zakariyyä Yahya Ibn Muhammad Ibn Ahmad Ibn Awwam al-Ashbili*. His valuable book is entitled *Kitab al-Falahah*. It is based on the works of his Greek, Roman, Nabatean and Ancient scientist predecessors, but also includes the author's personal observations. It is divided into two parts which consist of 35 chapters. Every chapter deals with some definite topics concerning agriculture. (10)

Another important book on agriculture was written by *Shaikh Radi al-Din al-Qarshi*. It is entitled *Jami' farā' id al-Malāhah fi Jawami' Fawa'id al-Falahah*. It consists of the following eight chapters:

1. Various kinds of soil
2. Watering, digging of canals and wells and taking out of water
3. Trees and their plantation
4. Various methods of plantation
5. Seeds and grains, their selection, sowing and cutting
6. Various types of flavours , flowers, etc.
7. Description of the days, months, weathers, etc., suitable for cultivation.
8. Storage of grains, seeds, dry and fresh fruits, some vegetables1 extracts, salts, yeasts, rose water, etc.' (11)

The first geographer and traveller who mentioned plants in his books was *Ibn al-Wādih al-Ya'qūbi* (d. 1794). He travelled throughout the Ancient scientist world and composed a work entitled *Kitab al-Buldān*. (12)

The famous geographer Abu Abd Allah Muhammad Ibn Muhammad Ibn 'Abd Allah Ibn Idris al-Husaini al-Saqali, commonly known as *al-Sharif al-Idrisi*, also wrote three works on plants and simple drugs. One of them entitled '*Kitab al-Jāmi' li-Sifat Ashtat al-Nabāt*' contains the description of various useful drugs relating to trees, fruits, roots, flowers, minerals, etc. The names of drugs have been arranged in alphabetical order, and their Arabic, Persian, Greek, Syrian, Latin and Berber names have been described. The author has mentioned the use of some plants and the oils and gums extracted from them. The book consists of four parts. The first part contains the description of 369 simple drugs and the second one of 250. (13)

The greatest botanist of the 16th century was *Da'ud Ibn Umar al-Nasir al-Antāki*. He was a distinguished physician as well No scientist compiled such a valuable work on simple drugs as he did. He made a remarkable addition to the knowledge of his predecessors regarding the simple drugs and their uses. (14)

An important botanist of the 18th century was '*Abd al-Razzāq Ibn Muhammad Ibn Hamadush Al-Jazā'iri*'. In 1717—18 he left for Makkah for the performance of Hajj . He wrote a book called '*Kashif al-Rumüz fi Sharh al-Aqaqir wa'l-A'shab*'. This book seems to be a summary of the books written on this subject by *Abd al-Razzaq's* predecessors with the addition of the new substances which were used by the Europeans as drugs. He also gave their common and local names. He derived information from the works of *Ibn Sinā*, *Ibn al-Baitar* and *Da'ud al-Antaki*. One thousand simple drugs in all have been dealt with. This was translated into French. (15)

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