

THE PORTUGUESE AND THE STUDY OF MEDICINAL PLANTS IN INDIA IN THE SIXTEENTH CENTURY

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Very little is known about the contribution made by the Portuguese to the study of Botany in the sixteenth century. In fact the Portuguese were the first Europeans to write scientifically on plants and especially on medicinal plants. Garcia da Orta who published his work *Coloquios dos Simples e Drogas da India* in 1563 from Goa is considered the pioneer in this field. He was the lease holder of the Island of Bombay since 1554. He was a qualified physician who was educated in the world-famous universities of Salamanca and Alcalá in Spain. He worked as a teaching faculty member in the Lisbon University and after a short term of work there, he came to India in 1534. He spent thirty six years in India engaged in studying various plants especially medicinal ones.

He had been to various places in India and established contacts with Indian rulers like the Sultan of Gujarat. He put some of the Indian physicians to shame in the use of medicinal plants for the cure of some diseases. He himself had an orchard in Goa and observed the efficacy of some plants to cure certain ailments. The present study is aimed at discussing the competence of the author to write an authoritative work on Botany, the various plants he studied and also the medical utility of some of them. He has not limited his enquiry only to the medicinal plants. This study could serve as a pointer to the evaluation of the contribution made by the Portuguese.

Keywords : Botany, *Coloquios dos Simples e Drogas da India*, Gracia da Orta, History of Science, Luis de Camoes, *Os Lusíados*, Portuguese.

A Concise History of Sciences in India, a pioneering and widely accepted work while dealing with the European interest in Botanical studies in India from the medieval times, has given a very limited description of the Portuguese contributions and writes, "Garcia, a Portuguese medical man came to India in 1534, had a garden in Goa and studied local drugs. He published in 1565 (sic) a book entitled *Coloquios des (sic) simples e drogas couso (sic) medicinalis da India, compostos pelle (sic)*"². Lack of information about the contribution of the Portuguese to the study of botany as well as the non-familiarity with the Portuguese language could be the factors responsible for the inadequate treatment of the subject. The decolonisation of the Portuguese settlements in India and the re-establishment of Luso-Indian diplomatic relations paved the way for academic exchanges and deeper investigations. Scientific and impartial studies based on contemporary and

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original sources are being made possible. An Attempt to bring to light the contribution of Gracia da Orta and Luis de Camoes the two Portuguese experts to the study of medicinal plants in the general framework of the History of Science is made in the changed milieu in the following pages. The work of these two writers must have definitely influenced Van Reed, the Dutch botanist and a number of other European scholars from England and France. But the present study is confined only to the works of the Portuguese writers and no attempt is made here to see their impact on other European work. Chiefly the contemporary Portuguese sources are made use of in this preliminary study.

Garcia da Orta, the author of the *Coloquios dos Simples e Drogas da India* was the first Portuguese writer to deal scientifically with the plants, both medicinal and otherwise, as well as fruits found in India. His academic and professional background singles out him as a well-qualified person to do the work. He was born in the last decade of the fifteenth century. After having completed the rudimentary studies in his native place Elvas near the Spanish border, he moved to Castill and later to the Universities of Alcala de Henares and Salamanca where he studied medicine and took Master's degree in it. His education was supported by the members of the family of Martim Affonso de Souza. With the assistance of the same family, he was appointed lecturer in the Lisbon University from 1532 to 1534. When Martim Affonso de Souza took charge of the fleet of 1534 destined to India as the captain-in-chief, Garcia da Orta was taken as the royal physician to accompany him. He reached India in September 1534. He was present at Diu when it was ceded to the Portuguese by Bahadur Shah, the sultan of Gujarat in 1535. Later he accompanied his patron, Martim Affonso de Souza to Kathiawar beyond Ahmednagar, served as his physician for some time. He assisted Martim Affonso de Souza in his campaign from Cochin against the Zamorin of Calicut and in Ceylon. These contacts put him in touch with various plants of India to enable him to write authoritatively about them. Apart from his own personal knowledge of plants of various sorts, he made inquiries from the yogis of the kingdom of Delhi, traders and other experts from places like the Deccan, Gujarat, Bengal, Persia, Arabia and Malayasia. When his patron Martim Affonso de Souza laid down his office as Governor in 1545, he continued work in India and served as physician to Pedro Mascarenhas (1554-1555). Moreover he had a house and a garden full of medicinal herbs in Goa. He was given the Island of Bombay on long lease in 1554.

He became a close friend of Dimas Bosque another qualified physician from Valencia who accompanied Dom Constantino de Braganca appointed viceroy to India in 1558 as his doctor. Bosque induced him to take up the work on the plants, drugs and samples of India and he himself wrote the preface to Orta's work. With the experience

he gained for a long period of forty years both in Europe and India, he was in a better position than any one else to work on a study of plants and their medicinal value. Another friend who assisted him in many ways was the immortal poet of Portugal, Luis de Camoes, who after his banishment to Macao came back to Goa in 1561 and established intimate friendship with Garcia da Orta. While Camoes was composing *Os Lusíadas*, he used to spend hours together in the house of Garcia da Orta admiring his collections and encouraging him in his work. At last the work of Garcia da Orta was completed during the viceroyalty of Dom Francisco Coutinho, Count of Redondo (1561-64) to whom he dedicated it. It was published at Goa on April 10, 1563 by Johannes de Endem³. Garcia da Orta served as physician to the Viceroys at Goa. He spent thirty six years in India practicing as a physician and died in 1570 at Goa.

The work of Garcia da Orta is acclaimed as the first scientific work on the part of the European writers in general and of the Portuguese writers in particular. It is the earliest description of plants and drugs found in India in a foreign language. Even the Spanish work of Christoval Acosta which followed immediately after this was only a wholesale copy of that of Garcia da Orta.

In the traditional style of the period, the treatise is in the form a dialogue between the fictitious Dr. Ruano, a famous writer in Salamanca and Alcala and da Orta himself. Ruano is depicted to have come to India in a ship in which he had a share with a desire to learn about the medicinal plants, drugs, their fruits, spices and how they were used by the physicians in India. Ruano is portrayed as an acquaintance of da Orta at the University level in Spain. The whole subject matter is treated in fifty nine dialogues or colloquies. The first dialogue deals with the way in which the treatise is organised and later he establishes the relevance of treating the various plants in alphabetical order.

The subsequent fifty eight dialogues deal with several plants, the scientific names of which are :

Aloes socotrina, Amomum Cardamomum, Nyctanthes arbor tristis, Semecarpus Anacardium, Ferula foetida, Cannabis Indica, Styrax Benzoin Garcinia indica, Acorus Calamus, Dryobalanops aromatica, Elettaria cardamomum, Cathartocarpus fistula. Revensara aromatica, Cocos nuciferca, Saussurea Lappa of Clarke, Biborate of Soda, Cubeba officinalis, Datura alba, Ivory, Areca catechu, Cinnamomum tamala, Alpinia Galanga, Caryophyllus aromaticus, Zingiber Officinale, Hollarhena antidysenterica, Artocarpus integrifolia, Coccus lacca, Aquilaria Agallocha, Acacia Catechu, Myristica fragrans, Cotoneaster nummularia, Mangifera indica, Meleagrina margaritifera, Cucumis Melo, Citrullus vulgaris, Terminalia Chebula, Nephellium litchi, Garcinia Mangostana, Vitex Negundo, Melia Azadirachta, Papaver somniferum, Pauwolfia serpentina, Piper

znigrum, *Piper longum*, *Guaiacum officinale*, *Rheum officinale*, *Pterocarpus santalinus*, *Nardostachys Jatamansi*, *Bambusa arundinacea*, *Andropogon laniger*, *Tamarindus Indica*, *Ipomoea Turpethum*, *Boswellia carterii* and *Balsamoderndro yrrha*, *Tutia* (a mineral medicine) *Curcuma aromatica* and *Piper Betle*. Da Orta deals also with Amber, diamonds, precious stones, Pedra bezar and a few other items.

The way in which he discusses each of the plants, fruits or other products of India is quite informative as well instructive. We shall take up one or two items to have a glance at the vast fund of knowledge transmitted by him through his scientific work less known to our historians of science for various reasons. *Aloes socotrina*, for example is discussed in the second colloquy. First he gives the name of *Aloes socotrina* in various other languages. Aloes or aloa is from Latin and Greek. The word used by the Arabs to denote the same is *Cebar* or *Saber* while *area* is used by the Gujaratis and the Deccanis. The Canarese use the word *Catecomer*, the people of Castill in Spain employ the word *acibar* while the Portuguese have *azevre*. The Turks and the Persians used the word *Cebar*. The herb used to be dried with smoke and was known to the Portuguese as *Hervababosa*. This plant was also known as *Suco-cetrino*.

After discussing the various expressions in different languages, he writes about the provenance of the plant. This grew in Gujarat, Bengal and many other parts of India. The best variety came from Socotra and India got it from Socotra that could be the reason for its scientific name *Aloes socitrina*. The merchants who dealt in this item knew the differences between the one brought from *Socotra* and from other parts of India. There was a flourishing trade in *aloes* between Socotra on one side and Arabia, Persia, Turkey and various parts of Europe on the other. The merchants used to export it from various parts of India to Ormuz, Aden and Jidda from where it was further sent to Cairo and Alexandria through the Nile. The Nizam Shah of Ahmednagar always got it imported from Socotra since this was the best variety. He corrects the mistake committed by some of the Portuguese who thought that *aloes* grew in Alexandria. He emphasized that this wrong information was due to the import of *aloes* to Portugal through Alexandria in the period before the opening of the direct sea-route to India through Cape of Good Hope by Vasco da Gama. During the period before it, commodities of the orient were taken to Ormuz, Bassora Aden, Juda or Jidda, Cairo, Alexandria, Venice and then to various parts of Europe.

Orta discusses the use of *aloes* by the physicians. The Persians, Arabs and Turks who were familiar with the works of Avicenna, Hypocras, Galen and others used these medicinal plants. The Indians used it as purgative, in treatment for kidney, colics, and for healing wounds. He speaks of a mixture of *aloes* and *myrrh* that is known to the pharmacists as *mocebar* or *bola*. This was used as medicine for horses and to kill maggots

in wounds. The bad variety of *aloes* known as *cabalino* in Portugal was used for farrieries purposes and for wounds. Da Orta reports that the physician of the Sultan Bahadur Shah of Gujarat used to get the pieces of leaves of *Herva babosa* boiled and salted. This preparation was used as an effective medicine for causing movement of bowels without any injurious side effects. Da Orta himself applied *aloes* to those suffering from diseases in kidneys or bladder while he was in Goa. He got the herb pounded and mixed with milk for the treatment of the sickness. This was also used to reduce inflammation in the gums. Application of *aloes* to the injuries to the legs of birds was well known.

The taste of this medicine was very bitter and it had a very strong smell as reported by da Orta. The bitterness was foreign to *Herva babosa* used in Portugal though it had a disagreeable odour. But *aloes* from India and Socotra had a bitter taste. The Portuguese physician writes that medicine made of *aloes* should be taken only after food as suggested by Galen and Pliny. He also mentions the divergence of opinion regarding this.

By way of digression he writes about the origin of the word *rumis* used to mean the Turks of Anatolia (Asia Minor) belonging to the Empire of Constantinople.

Da Orta continues to write about the side effects of the use of *aloes* considering the statements made by other physicians like Avicenna and his personal experience as a physician working in India⁴. He does not agree with Mesue who stated that *aloes* would open hemorrhage. However, he concedes that it can cause great pains with hemorrhage and he adds that it purges the bile remaining in the stomach and in the naval quoting the authority of Dioscorides and Seraphim.

Da Orta gives a lot of information about pepper that, according to him, was consumed in larger quantity in Flanders and Germany than in Portugal⁵. He states that the greatest volume of pepper was on the Malabar coast extending from Cape Comorin to Cannanore. A negligible volume of pepper was produced also in the area farther north. He further admits that some pepper was available in Malacca though it was not very good. The little quantity grown in the islands of Jawa, Sunda and Queda was spent in China. Pegu and Martaban. He speaks of the use of pepper in India itself specially Malabar. It is sent to Palghat where there was a great demand.

Garcia da Orta gives the name of pepper in various languages such as *molanga* (Molagu) in Malayalam, *lada* in Malayan language, *filfil* in Arabic, *meriche* in Gujarathi, and Deccani language and *morois* in Bengali, while long pepper was known as *darfulful* and *falfel* in Arabic according to Serapio. *Pepilini* was the name for long pepper in Bengal. Avicenna used *fulful* to indicate pepper. Da Orta makes the distinction between long and round pepper. Similarly he speaks of white and black pepper. He quotes the

wrong opinion held by ancient writers like Dioscorides, Avicenna, Galen, Paulo Egineta, St. Isidore and Serapiam, Mateas Silvatico, Sepulveda, Antonio Musa, and so on regarding the nature of white and black pepper and corrects it. He gives the prices of the two types of pepper in various places in India.

The wide knowledge of Garcia da Orta attained through his deep study of the works of previous scholars and the close observations during the long practice as a physician in India enabled him to dispel the wrong notions prevailing in the minds of the scholars. Several of these writers never had a chance of having any contact with the plants of which he wrote. Since he was familiar with the works of the eminent scholars of the past, he was able to check their assertions considering practical experience and expose the shallowness of their knowledge. He took diligence to collect information from people with whom he came into contact in India. He visited a number of places in India where the described plants were found. His treatment of the ailment of the son of the Nizam Shah of Ahmednagar by putting the local physicians to shame evinces the knowledge he had of Indian medicine ⁶. Thus the contribution of Garcia da Orta to the study of plants in India is strengthened by his theoretical and practical knowledge and remains as an important one to be studied in detail.

Another Portuguese writer who contributed to the study of botany was generally known as Cristobal Acosta, named in Portuguese as Cristovao da Costa, who was born in the African territory probably Queta or Tangir, one of the Portuguese colonies, came to India in 1568 as a physician/ surgeon in the fleet of D. Luis de Ataide, the Portuguese viceroy to India. He must have been 30 years old when he left Lisbon for India. In 1569 he visited Malabar, specially the places like Cranganore near the kingdom of Alangatt and Cochin. He served for some time in the royal hospital at Cochin and also treated the local ruler. He served as doctor in the fleet cruising the Malabar coast that visited several places on the coastal regions of Malabar. He visited Ceylon. Later he visited Tanur where he came across some trees as *moringa* of which he writes in detail in his book. He was again in Goa in 1571 where he showed *pau-de-maluco* to D. Luis de Ataide for the first time. He took great interest in checking the information about various products like *pimenta longa* in Bengal. He was found again in 1571 in Cochin from where he left for Lisbon and finally to Spain.

He began the composition of this work entitled *Tractado delas Drogas y Medicinas de las Indias Orientais, con sus Plantas debuxadas al biu por Christoval Acosta medico y cirujano que las vio ocularmente en el qual se verifica mucho de lo que escrevio el Doctor Garcia da Orta* in Burgos in Spain. He was qualified to write work of this nature on account of his training in Valladolid, Salamanca, Alcalá, Segovia, Madrid and his work in India and acquaintance with the treatise of Garcia da Orta. He worked as medical

practitioner in the Municipal town of Burgos till 1586. He died most likely in 1594. The above mentioned work was published in Spanish in 1578 at Burgos ⁷. The work of Christovao was translated into Italian in 1585 by Ziletti and published from Venice. Another translation into French was done in 1619 along with the work of Garcia da Orta. Though this work was to a large extent copy of the contribution of Garcia da Orta, the publication in Spanish gave the Spaniards an opportunity to know the plants in India.

Apart from the plants already discussed by Garcia da Orta, Christovao da Costa brought to the knowledge of the Spaniards a few other plants not dealt with by da Orta. They are :

Higuara de las Indias, Yerbaviva, Yerba mimosa, Pinares de Maluco, Palo de Maluco, Yerba de Maluco, Caius, Moringa, Ananas, Charameis, Sargasso, Carcapuli, Anil

But Acosta has omitted the following items found in the work of Garcia da Orta:

Benjuy (*Styrax Benzoin*), Criscola (*Biborate of Soda*), Linaloes (*Aquilaria Agallocha*), Mungo (*Cucumis Melo*), Mangosteen (*Nephellium Litchi*), Tutia (*Mineral medicine*), and other Beetle, Pearl precious stones

To conclude, one may say that the Portuguese who came to India chiefly for trade and commerce supported by the king, began to note down several things strange to their way of thinking and so they have left an immense wealth of information on society and economy. They were the first Europeans who started diplomatic relations with the local rulers and started colonial activities that were followed by the Dutch, the English, the Danes and the French. The contribution made by them to various aspects of life in India is modified and rectified by the subsequent powers. The attempts made by the Portuguese writers to highlight some of the plants add a lot of information to the study of botany. In fact following the work done by Garcia da Orta, the Dutch man Heinrich van Rheede published his work entitled *Hortus Indicus Malabaricus* in 12 vols from Amsterdam between 1678 and 1703 dealing with plants found in India. This is a monumental work of which approximately three fourth of a page is written in the *Concise History of Science in India*. There are other publications by the Europeans on this subject later on such as *Flora Indica* of Roxburgh, *Flora British India* by Hooker, *Materia Indica* of Whitelaw Ainslie, *Materia Medica of Westrn India* by Dymock *Useful Plants of India* of Colonel Drury, the *Useful Plants of the Bombay Presidency* of Dr. Liboa, and *Pharmographia* of Fluckiger and Daniel Hambury. With the establishment of cordial relations and starting of academic exchange programmes between India and Portugal and also by beginning studies in Portuguese language a better environment is created to assess the contribution of the Portuguese to the study of Botany.

NOTES AND REFERENCES

1. Bose D.M. et al, *A Concise History of Science in India*, New Delhi, 1971, pp. 401 ff.
2. In fact Garcia da Orta published his book in 1563 from Goa as it is clear from the title page of the book which reads : *Coloquios dos Simples e drogas e cousas medicinais da India e assi dalgumas frutas achadas nella. onde se tratam algumas cousas tocantes a medicina pratica, e outras cousas boas pera saber, compostos pello doutor Garcia dOrta, fisico del-rey nosso senhor, vistos pello muyto reverendo senhor, o licenciado Aleixo Dias Falcam, desenbargador da Casa da Supricacam, inquisidor nestas partes.* Another edition eliminating the typographical errors was also brought out from Goa.
3. This was the third book ever printed in India. This work evoked great interest among the Europeans and resumes and translations of the book were done various European languages. Charles de l' Escluze or Carlos Clusius made an epitome in Latin and was published in 1567 itself by Christopher Plantinus, Antwerp under the title *Aromatum et Simplicium Aliquot Medicamentorum apud Indos Nascentium Historia : primum quidem Lusitana lingua per Dialogos conscripta a D. Garcia ab Horto Proregis Indiae Medico auctore. Nunc vero Latino sermone in Epitomen contracta & iconibus ad vivum expressis, locupletioribus annotatumculis illustrata a Carolo Clusio Atrebate.* This was quite different from the original. Later on the occasion of the commemoration of the fourth centenary celebration of the work of Garcia da Orta, a translation of the epitome published by Carlos clusius into Portuguese was brought out by the Junta de Investigacoes do Ultramar, Lisboan in 1964. an Italian translation of the work of Garcia da Orta as summarized by Clusius saw the limelight with the effort of Anniball Briganti Marrancino de Chietti in 1582 from Venice by Francesco Ziletti under the title *Dell historia de i semplici aromati, e altre cose che vengono portate dell Indie Orientali pertente al uso de la Medicina scritta in lengua Portugheze dell eccellente Doctore Garcia del Horto.* A French translation of the work of clusius was published from Paris in 1609 and from Lyons in 1619 by Antoine colin under the title *Du Jardin.* these two works being based on the book of Clusius, do not reflect in totality the original work of Orta. F.A. de Varnhagen brought out an edition of *Coloquios* in 1872 from Lisbon which did not add anything new except a number of imperfections. The standard edition of the work in Portuguese was brought out with valuable annotations by Count of Ficalo in 1891 and the second edition of the work in Portuguese was brought out with valuable annotations by Count of Ficalho in 1891 and the second edition in 1895. The editor was an accomplished botanist. The english translation of the edition of 1895 was made by Sir Clements Markham K.C.B. F.R.S., Hon. Fellow of the Asiatic society of Bengal under the title *colloquies on the Samples & Drugs of India* by Garcia da Orta and was published by Henry Southeran and Co from London in 1913. His work is referred in *Pharmographia* of Hanbury and Fluckiger as the best work on *Materia Medica* as an authority on the subject.
4. Conde de Ficalho, ed. *Cloquios dos Simples e Drogas da India por Garcia da Orta*, Lisboa, 1891, p. 25-43.
5. Conde de Ficalho, op.cit, vol ii. 1892, pp. 241-252.
6. Ficalho, op.cit., pp. 141-143.
7. His work is reprinted in Portuguese in 1964 from Lisbon under the title *Tratado das Drogas e Medicinas das Indias Orientais por Cristovao da costa no qual se Verifica muito do que escreveu o Doutor Garcia da Orta.* This work was translated by Carlos Clusius into Latin and was published from Antwerp in 1582 under the title : *Christophori a Costa Medici, et Chirugi aromatum, et medicamentorum in Orientali India nascentium liber plurimum lucis afferens iis quae a D. Garcia ab Horto in hoc genere scripta sunt. Caroli clusii Atrebatensis opera ex Hispano Latinus factus & c.*