The depictions of the spice that circumnavigated the globe. The contribution of Garcia de Orta's *Colóquios dos Simples* (Goa, 1563) to the construction of an entirely new knowledge about cloves

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Abstract: Cloves have been prized since Ancient times for their agreeable smell and therapeutic properties. With the publication of *Colóquios dos Simples e Drogas he Cousas Mediçinais da Índia* (Goa, 1563), Garcia de Orta (c. 1500-1568) presented the first modern monographic study of cloves. In this analysis I wish to clarify what kind of information about Asian natural resources (cloves in particular) circulated in Europe, from Antiquity until the sixteenth century, and how the Portuguese medical treatises, led to the emergence of an innovative botanical discourse about tropical plants in Early Modern Europe.
Keywords: cloves; *Syzygium aromaticum* L; Garcia de Orta; Early Modern Botany; Asian drugs and spices.

Imagens da especiaria que circunavegou o globo
O contributo dos *colóquios dos simples* de Garcia de Orta (Goa, 1563)
à construção de um conhecimento totalmente novo sobre o cravo-da-índia.

Resumo: O cravo-da-Índia foi estimado desde os tempos Antigos por seu cheiro agradável e propriedades terapêuticas. Com a publicação dos *Colóquios dos Simples e Drogas, e Cousas Mediçinais da Índia* (Goa, 1563), Garcia de Orta (1500-1568) apresentou o primeiro estudo monográfico moderno sobre tal especiaria. Nesta análise, gostaria de esclarecer que tipo de informação sobre os recursos naturais asiáticos (especiarias em particular) circulou na Europa, da Antiguidade até o século xvi, e como os tratados médicos portugueses levaram ao surgimento de um inovador discurso botânico sobre plantas tropicais na Europa moderna.
Palavras chave: Cravo-da-Índia; *Syzygium aromaticum* L; Garcia de Orta; Primórdios da botânica moderna; drogas e especiarias asiáticas.

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Vê Tidore, e Ternate co fervente
Cume que lança as flamas ondeadas:
As árvores verás do cravo ardente
Co sangue português inda compradas
CAMÕES, *Lusíadas* (X, 132)

First reports on cloves in circulation in Europe

Appreciated by wealthy men since Antiquity for their pleasant smell and used in medicine for their therapeutic qualities, cloves — the aromatic flower buds of *Syzygum aromaticum*, a tree in the family Myrtaceae — were one of the most expensive Asian spices.[2] However, ancient texts made only limited reference to them.[3]

Cloves were mentioned only in passing by Pliny just after the depiction of Indian pepper, «[t]here is also in India a grain resembling that of pepper, but larger and more brittle, called the *carvophyllon*, which is reported to grow on the Indian lotus-tree; it is imported here for the sake of its scent» (Pliny liv. 12, cap. XV) and were left out of Dioscorides' *De Materia Medica*.

Paul of Aegina recommended the use of cloves in different pharmaceutical preparations. Avicenna considered them good for digestion and an effective remedy for sharpening vision. He also used them to treat diabetes and other metabolic disorders. Other Arab physicians, such as Rasis, Serapion and

[2] *Syzygium aromaticum* (L.) Merril & Perry is a synonym of *Caryophyllus aromaticus* L., *Eugenia aromatica* (L.) Baill. or *Eugenia caryophylatta* Thumb. *Germoplasm Resource Information Network* (GRIN 2011). Besides the spice — the aromatic flower buds — there are two other parts of the *Syzygium* flowers that are used: the flower peduncles and the fruits. Clove contains diverse volatile oils such as eugenol, acetyl eugenol, ß-caryophyllene and vanilin. The most significant oil is eugenol which has numerous medical and commercial applications. It can be extracted primarily from unopened flower buds, though it can also be extracted from the flower peduncles or the leaves of the clove tree.

[3] Due to the economic relevance of this spice some in-depth research analyzes cloves focusing on the geopolitical context, circulation, commerce and the therapeutic uses of this tropical product. For further analysis on this topic, see: Lobato (1999: 104-130); Thomaz (1975: 29-48); de Silva (1987: 135-146); Ptak (1993: 1-13); Donkin, (2003: 24-45). For more detailed information on the distribution, nomenclature, ecology, biology, yield and production of cloves, see: Ferrão (1993: 103-137) or Donkin (2003: 1-7).

Mesue, presented brief information about the therapeutic uses of cloves. Serapion referred to different therapeutic formulations made with the «Carunfel», such as antidotes and *mytridathe*. Mesue also recommended the use of the spice in his *Antidotarium*.[4]

For centuries, clove's provenance remained a mystery. Cosmas Indicopleustes was aware that clove country lay somewhere between Ceylon and the Cathay. Some Arab geographers such as al-Masu'di and al-Idrísi as well as travelers like Ibn-Batuta, believed it to originate in Far-East islands such as Sumatra or Ceylon.[5] European travelers like Marco Polo or Fr. Odoric de Pordenone reported it in Java. In the middle of the 15th century, Nicolò de'Conti was the first European to correctly report the provenance of the spice. However, he did not present any description of the clove tree. De'Conti was very curious about Asian botany. In his account we find references to Asian products such as: aloes, camphor, cinnamon, cloves, ginger, indigo, nutmeg, mace, pepper, pearls and precious stones.[6]

De'Conti's information about Asian spices and drugs was presented by Fra Mauro in his masterpiece, the *Mappamundi* (1459). This friar based his rep-

[4] On «Karanful», Ashtor explained: According to the Arabic dictionaries, varying names were given to this plant [the clove tree], including *karnful* and *karnfūl* , whilst popular pronunciations included *kuranful* and *kuranfil* (http://brillonline.nl/browse/encyclopaedia-of-islam-2). For further details on «Carumfel» or «Charunful» in Early Modern sources, see: Avicena (1555, lib. II, cap. 138: 132); Serapion (1550, *Lib. Temperamentis*, cap. 309: 172v); Mesue (1546, cap 18: 70-72). In 1578, Cristóvão da Costa presented the «names [nõbres]» of this spice in several languages. He wrote: «Llamase este Clavo en Latin, Cariophilus; Arabio, Parsio y Turco, Carãful, y al arbol que da los clavos, Siger: y a la hoja Varaqua; en Malunco, Chãque; Castellano, Clavos de especias; Portugues, Clavos; Vasquence, Clavos; Frãces, Clao de Girofle; los Germanos, Negelin; los Apolonios, Guozdziki» (Costa 1578: 33).

[5] Ibn Batuta's depiction of the clove tree included several inaccuracies. Taking into account an old legend in circulation in some Indian markets, the traveler reported that cinnamon was the bark, clove was the flower and nutmeg was the fruit of one and the same tree. The myth, that the clove was the flower of the nutmeg, prevailed in Europe until the sixteenth century. In *Voyage autour de la Terre* (1356), John de Mandeville refuted this myth and added some new precision to knowledge of nutmeg and mace. Mandeville (1915: 125).

[6] Like Marco Polo's report, Fr. Odoric de Pordenone's text and Mandeville's aforementioned book, De'Conti's itinerary was included in Ramusio's *Delle Navigatione et Viaggi*, a compilation of travel reports published in Venice and widely disseminated in Europe from 1550. For an approach to «the discovery of the Moluccas by the Europeans», see Donkin (2003: 24-32).

resentation of the world on ancient texts as well as on the travel reports of Marco Polo, Nicoló de'Conti and other written sources, and on geographical treatises such as those from al-Idrísi or Ptolemy. The detailed depiction of castles and walled cities or the precise placement of flags and banners were as important as the meticulous inscriptions containing information about the ports of origin of Asian spices and drugs. At the beginning of the sixteenth century, European knowledge about the clove tree was very fragmented and scarce.

Rediscovering Asian natural resources

In 1502 the Cantino planisphere provided an accurate description of the lands and seas from the West to the Far-East. Curiously, this map also included a significant amount of new information about Eastern natural resources. This data had been collected by the Portuguese since their arrival in Calicut, in 1498, and attests to the fact that, since they had first set foot in Asia, Portuguese officials had begun their collection of tactical information.

In 1510, Ludovico de Varthema published, in Rome, his *Itinerario*, where he described his travels to the East. Having fought alongside the Portuguese troops, he returned to Europe with the fleet of the Portuguese Captain Tristão da Cunha. During the long journey from Goa to Lisbon, the Italian became aware of the information about Asian natural resources that circulated among sailors, soldiers and Royal officers. In his account we can find descriptions of Asian fruits (durian, jack-fruit), drugs and spices (cinnamon, pepper, cardamom, ginger, cloves, galangal, nutmeg, maces, camphor, sandalwood, aloes and some others), — as well as detailed references to precious stones (diamonds, rubies, sapphires, topaz). Thanks to the wide diffusion of this report, from 1510 Europeans became aware of the location of the islands from which cloves came. In the chapter concerning the island of Monoch, (*sic*) he depicted the clove tree which he claimed to have seen.

> The mountains of these five islands are all full of cloves, which grow on certain trees like the laurel, which has a leaf like the comari and grows like the flower of an orange. In the beginning it [the clove] is green, then it becomes white, and when ripe is red. The people then gather it with the hand, climbing on the trees, and place it to dry in the sun, which makes it black; and if there is no sun, they dry it in smoke, and when it is well dried, they sprinkle it with acqua salsa [this

> may mean salt water][...] Those trees from which fruit is not collected for three years remain in a wild state, and those cloves are worthless (Varthema 1863: 245).

The Portuguese informants tried to collect data which could help them to understand how the regional political and economic balance in the East was established and maintained. A systematic information-gathering amongst local people, ordered by the King, can be confirmed by the important number of confidential letters, maps and reports that were exchanged between the Portuguese administrative elites of Goa and the Lisbon Court.

FIGURE 1. Thanks to Ludovico de Varthema's *Itinerario* (Rome, 1510), Europeans became aware of the location of the islands from which cloves came. The book had a wide diffusion in Europe. In 1520 the first Castilian version was published (BNP RES 217-1-A).

Among them, the detailed reports that Francisco Rodrigues, Tomé Pires and Duarte Barbosa sent to the Kingdom were the result of a methodical inquiry into Asia. This collection of data depended on the credibility of their local sources. Since their arrival in the East, the Portuguese Royal officers had searched for trustworthy interlocutors. The ability to communicate with local communities was the first challenge that the Portuguese officials had to overcome. To communicate with local informants, most of them had to gain some familiarity with regional languages. At the end of their reports, some Royal officers, such as Duarte Barbosa, put together a small list of local words that became important in promoting dialogue between the Portuguese and their Oriental interlocutors.

As they learned from Malayan, Arab, Persian, Gujarat, Javanese and Chinese merchants, it was from Malacca that the Kingdoms of the Moluccas received goods as well as most cultural influences. Although they produced the valuable cloves, these islands were highly dependent on the outside world for the supply of basic commodities, such as *sago* and rice — from Moro, Batjan

and Ambon — and cotton clothes — from Cambay. Cloves, especially those from Ternate, were traded for other Asian products. Upon arrival in Malacca, a proportion of clove production was exported to China, Siam, Pegu, Bengal and Coromandel. An important part was sent to India and traded in the Malabar markets of Cochin and, especially, in those of the Gujarat Kingdom. Cambay remained the most important supplier of spices and drugs to merchants. Sailing on the Red Sea or through the Persian Gulf, these men reached other ports and markets.[7]

From 1511, the Portuguese had direct access to the markets and products of the Far East. Soon, Afonso de Albuquerque tried to establish friendly relations with local rulers and commercial alliances with drug and spice suppliers. The first Portuguese expedition sent from Malacca to the Moluccas was commanded by António de Abreu. It reached Ambon and Banda but, unfortunately, did not make it to the Moluccas. It was only in 1513 that journeys between the Portuguese ports in Malacca and Ternate became regular. Jorge de Albuquerque was named Captain of Malacca in 1514. In January 1515 he sent a missive to King Manuel from the King of Ternate pledging allegiance to the Portuguese sovereign. Albuquerque also sent a peculiar gift: a clove tree trunk and a small branch with some leaves and flower buds.[8] More than written sketches of cloves, the branch sent by the Portuguese Captain to the sovereign suggested that the control of clove production and trade belonged to the King of Portugal.

Situated at the Oriental extremity of the lands reached by the Portuguese voyages of exploration, the Moluccas islands played an important role in the history of Early Modern Europe. The islands of Ternate, Tidore, Moti, Makian and Batjan were the sole locations where *Syzygium aromaticum* grew naturally and produced flowers. The best cloves came from Ternate Island. Later, due to the economic relevance of this spice, the Europeans introduced the tree in other tropical areas.[9]

[7] On this topic see amongst others: Silva (1987: 135-146); Ptak (1993: 1-13) and Pearson (1996).

[8] This letter was published by Artur Basílio de Sá. For a recent reference see: Garcia (2007: 60-80).

[9] As referred to by Donkin and Ferrão, seedlings were taken during the seventeenth century to Mauritius, Bourbon, Cayenne, French West Indies, Bengal, Sri Lanka, Penang and Sumatra. Later, the spice was produced in Zanzibar, Pemba, Madagascar and Brazil.

From 1515, some new and detailed Portuguese reports about the Far East arrived in Lisbon. The cartographer Francisco Rodrigues addressed a volume to the King, composed between 1512 and 1514. The *Book of Francisco Rodrigues, Rutter of a voyage in the Red Sea, nautical rules, almanack and maps, written and drawn in the east before 1515* [*Livro que fez Francisco Rodrigues piloto mor da Primeira Armada que descobriu Banda & Maluco*], included rutters, nautical rules, almanacs, maps and panoramic sketches drawn by Rodrigues on his return voyage from Banda to Malacca. This volume contained a vivid and faithful representation of the islands of the Far East, pictorial descriptions of local resources and maps of the region of Insulindia. The volume was bound together with another important report: *Suma Oriental of Tomé Pires: an account of the east, from the Red Sea to Japan, written in Malacca and India in 1512-1515* [*Suma Oriental*].[10] Tomé Pires was appointed as an apothecary at the Portuguese Court. Sent to India in 1511 as a 'drug trade agent', [feitor das drogas] he settled in Cananor until 1512, when Afonso de Albuquerque sent him to Malacca. In 1515 he returned to India where he concluded his *Suma Oriental*. However, instead of embarking for Lisbon, as he expected, he was named, by the King, as the first Portuguese ambassador to China. Before leaving for the Celestial Empire, the apothecary-diplomat concluded his exhaustive report, which contained strategic information of a large area covering coastal regions from the Red Sea to Japan. The *Suma Oriental* presented accurate information on the geographical, economic, historical and religious nature of a vast region. The manuscript circulated in the Portuguese Empire and was partially published in Ramusio's encyclopedia.[11]

Apart from this detailed account, Tomé Pires sent a comprehensive letter to King Manuel where he presented up-to-date information on Asian drugs and spices. Some of the first modern mentions of rhubarb, incense, opium, tamarind, galangal, myrabolans, aloes, spode, spikenard and bdellium were in-

Nowadays, Indonesia and Madagascar are the largest clove producers (FAOSTAT 2013). The majority of the Indonesian production is absorbed by the industry of aromatic cigarettes — the *Kretek* — a very popular product which contains a blend of tobacco and clove. Donkin (2003: 4) and Ferrão (1993: 104-108).

[10] In the *Cataloque génèrale des Manuscrits des Bibliothèques Publiques de France*, p. 471, the manuscript is described as *Journal de Francisco Rois, pillote de la flote portugaise, qui découvrit les Molluques. Ouvrage divise en deux parties, la première remplie par des cartes, la deuxième contenant le texte proprement dit*. For an English version see: Cortesão (1944).

[11] A second manuscript of this text was located in Lisbon, at the Biblioteca Nacional de Portugal, COD. 299/2. For a recent edition of Pires's work, see: Pires (1996).

cluded in this classified document. As a former pharmacist he was particularly concerned with locating the origin, main routes of supply and markets of local medicinal products.[12]

Another important account was Duarte Barbosa's *Book* [*Livro das Coisas do Oriente*]. Leaving for Asia in the armada of Pedro Alvares Cabral in 1500, he replaced Pires when he was sent to Beijing. Fluent in Malayalam, he was able to conduct a survey of and assemble a precious amount of geographical data about Asian natural products and descriptions of the main routes of supply. He also reported on some of the cultural practices, religious habits and political systems of a wide region. He undertook a range of administrative tasks and was a fairly well-informed scribe at Cananor [escrivão da feitoria de Cananor]. The variations in the several manuscript versions of Barbosa's text reflect its wide circulation and its continuous updating. Ramusio published Barbosa's report in his collection of travel accounts, which ensured the circulation of this knowledge throughout Europe. His depiction of the clove tree is very faithful to the description already in circulation.

He wrote:

> The hills in these five islands are all of cloves, which grow on trees like laurel, which has its leaf like that of the arbutus, and it grows like the orange flower, which in the beginning is green and then turns white, and when it is ripe it turns colored, and then they gather it by hand, the people going amongst the trees, and they put it to dry in the sun, where it turns brown, and if there is no sun they dry it with the smoke, and after it is very dry they sprinkle it with salt water for it not to crumble, and that it may preserve its virtue. And there are such quantities of these cloves that they never can finish gathering them, so that they let much of it be lost. And the trees from which they do not gather it for three years, after that become wild, so that their cloves are worth nothing. Every year the people of Malaca and Java come to these islands to ship cloves, and they bring as merchandise, quicksilver, vermilion, stuffs from Cambay, Bengal and Palecate, drugs from Cambay, some pepper, porcelain, large metal bells which are made in Java, dishes of copper and tin. The cloves are worth very little in these islands, so as to be almost for nothing (Barbosa 1918: 201-202).

[12] This letter was addressed by Tomé Pires, from Cochim, on 27 January 1516. The manuscript is in the Arquivo Nacional da Torre do Tombo, *Corpo Cronológico*, Parte 1ª, Maço 19, Doc. 102. See: Cortesão's edition (1978: 446-457).

These reports support the idea that an important amount of classified information about the Asian natural world circulated in the Portuguese Empire. In addition, an important epistolary exchange between sovereigns, governors, missionaries, Royal officers and travelers spread new information about the origins of the Asian natural resources. The contribution of an important number of pragmatic Royal agents became a fundamental tool for the construction of knowledge about the empire's natural resources.

But, in the Iberian Peninsula, both sovereigns were determined in the collection of novelties from the Moluccas. In 1519 Magellan presented to Charles V (r. 1519-1556) his audacious plan to reach the Spice Islands by travelling west. When, after a long transoceanic voyage, the *Victoria* arrived in Seville, El Cano and Antonio Pigafetta were effusively received. In the report presented to the Emperor the traveler included a description of the clove tree.

He wrote:

> That same day, I went ashore to see how the clove grows. The clove tree is tall and as thick as a man's body or thereabout. Its branches spread out somewhat widely in the middle, but at the top they have the shape of a summit. Its leaves resemble those of the laurel, and the bark is of a dark color. The cloves grow at the end of the twigs, ten or twenty in a cluster. Those trees have generally more cloves on one side than on the other, according to the season. When the cloves sprout they are white, when ripe, red, and when dried, black. They are gathered twice per year [...].Those trees grow only in the mountains, and if any of them are planted in the lowlands near the mountains, they do not live. The leaves, the bark, and the green wood are as strong as the cloves. If the latter are not gathered when they are ripe, they become large and so hard that only their husk is good. No cloves are grown in the world except in the five mountains of those five islands (Pigafetta 1906 (2): 87-88).

Even if this text might initially have had a limited dissemination, a new version circulated widely, from 1523, in Europe. Maximiliano Transilvano, the private secretary to Charles V, sent the Cardinal-Archbishop of Salzburg the report of the inquiry he made to Pigafetta. In his *De Moluccis Insulis*, Transilvano was very faithful to Pigafetta's narrative. Despite the reference to some new details, it appears that botanists continued to look upon this description with suspicion.

After the signing of the Zaragoza Treaty, the Portuguese Crown had a new mission to accomplish: sponsorship for gathering new knowledge about the Far

Eastern archipelago's natural resources.[13] As recently argued, Early Modern botany profited from colonialism and long-distance trade. According to Londa Schiebinger and Claudia Swan, the development of botany and Europe's commercial and territorial expansion were closely associated with one another.[14]

European scholars assumed that publishing new information about the Asian natural world was a task for the Portuguese physicians. Only they, using both reason and experience, could contribute to the successful accomplishment of this mission. With their expertise and know-how, these Portuguese doctors would bring splendor and honor to the King and new knowledge to the world of science. Rather than relying on the empirical descriptions of Asian plants provided by travelers and adventurers, scholars waited for the trustworthy botanical findings collected and validated by the Portuguese medical elites.

The construction of a new knowledge: Garcia de Orta's contribution

Despite several transformations, criticism and adaptations, Classical knowledge survived in Early Modern Europe.[15] As previously mentioned, cloves were almost absent from Greek treatises. The inclusion of information about this valuable spice in modern versions of Ancient botanical texts reflects this updating of knowledge. In the sixteenth-century edition of the Theophrastus' *Historia Plantarum,* Conrad Gessner added some information on cloves. A

[13] Treaty signed in 1529 by the Emperor Charles V and King John III regarding the areas of influence of the Iberian Crowns in Asia and, particularly, over the Spice Islands.

[14] The construction of a new natural knowledge in Iberian Empires has been recently deeply discussed. In the context of this essay its important to mention the contributions of Pardo-Tomas and López-Terrada (1993); Cañizares-Esguerra (2006: 14-45); Barrera (2006: 29-100); Findlen (2006: 435-468); Navarro Brotóns and Eamon (2007); Schiebinger (2007: 119-133); Schiebinger and Swan (2007); Raj (2007); Bleichmar *et al* (2009); Sánchez and Leitão (2016: 107-112).

[15] On the reception of Ancient texts in Early Modern Europe, see amongst others: On Pliny's *Historia Naturalis*: French and Greenway (1986) and Nutton (1997: 2-19); on Dioscorides's *De Materia Medica*: Stannard (1966: 1-21) and Riddle (1980: 1-143); on Avicenna's *Canon:* Siraisi (1987: 43-76). For a global approach to this topic, see: Nutton (2012), Enenkel (2014) and deBeer (2014: 329-362)

similar concern was visible in the Commentaries added to some modern versions of *De Materia Medica*. This was the case in Amatus', Mattioli's or Laguna's commentaries. These scholars added a reference to cloves in their comments to Book II, chapter 153 «De pipere» or «Da pimienta». They collected the information in circulation in Ancient texts, in particular from Paulo de Egina's, Avicenna's or Serapio's medical treatises.[16] Like other scholars, Andrés de Laguna preferred to ignore the uncertain findings of «anonymous» travelers and continued to reproduce the knowledge of Ancient authors. He wrote:

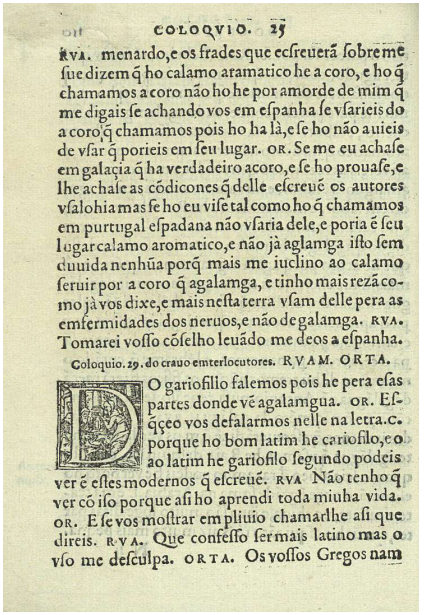
> Muchas veces he querido informarme de los que vienen de la India Oriental, cual sea la planta q nos imbia la pimienta, empero píntenla tan diferentemente unos de los otros, que no los creo, ni me parece q alguno de los jamás la puede haber visto. [...] Así q lo más seguro será, dicer con muchos y muy excelentes escritos de los antiguos, los cuales pudieron ser muy bien informados... (Laguna 1555, lib. II, cap. 148: 237).

Learned Europeans had to wait patiently until 1563. It was only then that Garcia de Orta set down in words accurate and reliable descriptions of Asian plants and drugs. Dedicated to the Vice-roy of India, D. Francisco Coutinho (r. 1561-1564), approved by the Inquisitors of Goa, his *Colóquios dos Simples he Drogas e cousas Mediçinais da India* (*Colloquies on the Simples and Drugs of India*) gave Europe the first authoritative modern description of Oriental natural resources.

Orta's scientific background — he studied Medicine in Salamanca and Alcalá de Henares — and his long professional experience as a doctor at the *Royal Hospital of Goa*, [Hospital Real de Goa] reaffirmed his authority.[17] His academic training and an important library gave him a solid medical and botanical

[16] There are several modern editions of these treatises. In those I analyzed, some information on cloves was added by scholars. See: Conrad Gessner (1541, HP: 34-34v); Amatus (1553, liv. 2, Enarr. 153: 265-266); Mattioli (1559, lib. II, cap. 153: 314-316) and Laguna (1555, lib. II, cap. 148: 237-238).

[17] Orta's first biography was described by Ficalho (1886). Later, some new notes about his Judaic origins were added. See: Carvalho (1934: 61-246), Révah (1960: 407-420) and Arrizabalaga (2015: 11-32). For further biographical notes, see: Boxer (1963), Carvalho (2012: 33-98 and 225-270), or Carvalho (2015: 91-140). On the economic context of the *Colloquies* see, amongst others: Pearson (1996) and Cook (2007: 75-125).



COLOQVIO. 25

RVA. menardo,e os frades que escreuerã sobre me sue dizem q̃ ho calamo aramatico he a coro, e ho q̃ chamamos a coro não ho he por amorde de mim q̃ me digais se achando vos em espanha se vsarieis do a coro q̃ chamamos pois ho ha là,e se ho não auieis de vsar q̃ porieis em seu lugar. OR. Se me eu achase em galaçia q̃ ha verdadeiro acoro,e se ho prouase,e lhe achase as cõdicones q̃ delle escreuẽ os autores vsalohia mas se ho eu vise tal como ho q̃ chamamos em purtugal espadana não vsaria dele,e poria ẽ seu lugar calamo aromatico,e não jà aglamga isto sem duuida nenhũa porq̃ mais me iuclino ao calamo seruir por a coro q̃ agalamga, e tinho mais rezã como jà vos dixe,e mais nesta terra vsam delle pera as emfermidades dos neruos,e não de galamga. RVA. Tomarei vosso cõselho leuãdo me deos a espanha.

Coloquio. 29. do craue emterlocutores. RVAM. ORTA.

O gariofillo falemos pois he pera esas partes donde vẽ agalamgua. OR. Esçeo vos defalarmos nelle na letra.c. porque ho bom latim he cariofilo,e o ao latim he gariofilo segundo podeis ver ẽ estes modernos q̃ escreuẽ. RVA Não tenho q̃ ver cõ isso porque asi ho aprendi toda miuha vida. OR. E se vos mostrar em pliuio chamarlhe asi que direis. RVA. Que confesso ser mais latino mas o vso me desculpa. ORTA. Os vossos Gregos nam

FIGURE 2. *Colóquios dos Simples* (Goa, 1563). In this first scientific treatise published by the Portuguese in the East, Garcia de Orta presented completely renewed information about cloves (BNP RES 456 P).

knowledge supported by a vast specialised literature.[18] Nevertheless, in his search for knowledge of the Asian natural world, he did not dispense with the contribution of local informants and Royal officials, who by travelling through the innermost recesses of the East collected information of Asia's natural resources. The participation of these agents in the reconfiguration of knowledge about the Asian natural world was a major contribution to European science.[19]

Published in Asia, the treatise contained the first modern descriptions of the most important Oriental plants, drugs and spices. Composed in Portuguese, the Imperial language, the text was published in the form of a dialogue between two Iberian physicians named Orta and Ruano. *Colóquios dos simples* provided the most up-to-date knowledge on the main Oriental products. Organized in alphabetical order, it presented detailed data about each product: its origin, use, price, markets, distribution routes and therapeutic applications. Even if his work was limited to verbal depictions of nature, *Colóquios dos Simples* brought to Europe the first modern monographic representation of Asian plants.[20]

[18] Orta's text reveals a rich and up-to-date library. See: Ficalho (1886: 280-298); Loureiro (2008: 135-146); Županov (2009: 21-31); Carvalho (2015: 165-201); Pimentel and Soler (2014: 101-120).

[19] For an approach on the information networks in Goa, see: Calado (1960: 1-158); Carvalho (2013: 13-28) and Loureiro (2012: 41-72).

[20] Published in Goa, the *princeps* edition had some particular characteristics. From the printing point of view, the book seemed a careless work and was the subject of prompt criticism from Orta; Carvalho (2016: 232-251). Besides this, some of Orta's editorial decisi-

The twenty-fifth chapter analyzes the «cravo».[21] After a short discussion about the true Latin name of the spice, Orta's study on cloves begins with some political considerations:

> You must know that Maluku is within the line of Portuguese conquest, which extends 200 leagues further, as has been proved by observing eclipses. But the devil entered into a Portuguese [Magellan] who, because the king would not grant him an unjust favour for which he asked, went over to Castille, fitted out armed ships, and discovered a strait, before unknown, which led to another route to Maluku [...]. The king of one of the islands, called Ternate, when it was put to him that he should help the Spaniards, said that the clove was given by God to the Portuguese, because each clove contains the *quinas* of the Kings of Portugal (Orta 1913: 215-216).

After these brief statements, Orta described the clove tree as he had been told by those who had seen it and were «trustworthy». He used information published by Ramusio and also that was gathered by Portuguese administrative officials like Duarte Barbosa, Tomé Pires or António Galvão, the Captain of Moluccas who was a close friend.[22]

Quoting the reports in circulation, Orta wrote:

> The trees are of the height and shape of a laurel. They have many flowers which are made into cloves. The plant grows like myrtle. The flower is first white, [and] then green, and finally vermilion and hard, which is the clove. I have been told by

ons were criticized by European scholars. For further analysis on this topic, see: Županov (2015: 49-66).

[21] As the Royal chronicler Diogo do Couto explained, the name «cravo» was given to the spice by the Portuguese «porque os primeiros nossos, que foram ter aquelas ilhas, tomando-o na mão, e vendo a semelhança que tinha com hum cravo de ferro, lhe ficaram chamando cravo por onde hoje é tão conhecido no mundo» Couto, (1778: 175).

[22] In *Tratado das ilhas Molucas* (1544) Galvão wrote: «a árvore que dá o cravo é grande; chamam-lhe craveiro; a folha tem o sabor do fruto, quem o quiser ver olhe um loureiro quando está florido» Galvão (1989: 11-12). For an English version of Galvão's text see Jacobs (1971). On António Galvão, see: Loureiro (2004: 85-102). Like Galvão, another Portuguese Royal officer, Gabriel Rebelo, presented to the Viceroy D. Constantino de Bragança, *Informação das coisas de Maluco,* a comprehensive report on the Moluccas where some information on the clove tree was added (BNP COD 923).

> those who have seen it, and are worthy of credit, that when the flower is green it gives off the most delicious scent in the world.

And he continued his depiction, correcting the information in circulation whenever necessary.

> They [the flowers] grow from buds, like the myrtles, and some say that that the cloves come from within; but that is not so, only the bunches (*sic*) do not come to perfection. [...] The cloves are dried for three or four days, and thus they sell them, and keep them to send to Malacca and other parts. The clove which is left on the tree becomes larger, and they like it, in this way, in Java. We, with the others, call it the head. You must know further that nothing whatever grows under or round the clove tree, because the clove draws up all the juice out of the earth.

Orta's long experience in Asia conferred him enough authority to contradict the Ancients. Asked about the «fuste», he explained:

> This is what we call «the mother-of-clove» not because it is so, nor is it male, as Avicenna and Serapiam say, for all is one, but because it is older than the others. For what we call «the mother-of-the-cloves» is not of the same year, but the year before. This was told to me by persons who know. One was a «feitor» from Maluco, who said that from the clove tree is much ripe fruit which falls down.[23]

And he continued:

> According to my information the people of Maluco do not use these trees themselves. The Chinese came in their ships to this land, and took the cloves to their country and to India, Persia, and Arabia.[24]

[23] By the end of the sixteenth century John Gerard presented a depiction of «*fusses of Caryophyllum*». Gerard's illustration on the «fusses» seems to be adapted from the «Antophylli» image presented by Adam Lonizer in 1538 (Gerard 1597: 1351-1352). On Gerard see Knight (209: 69-111).

[24] As mentioned by Ptak, cloves were one of the most important commodities in early intra-Asian and Euro-Asian trade. Ptak (1993: 1-13). On the use of cloves in Asia, see: Donkin (2003: 47-84 and 143-187).

Quoting his personal sources, he also described how cloves were collected; their local uses in conserves with sugar, vinegar and salt or scented waters.

He added:

> The people of Malacca use the vinegar conserve when they can get it, and the Portuguese women, living in Maluco, distil water with the green cloves, which is very fragrant and a good cordial. It would be a good thing to introduce it into Portugal.

Orta also made reference to local medical uses:

> Many Indian physicians make a sudorific with cloves, nutmeg, mace, and long black pepper, and they say it draws out the Castilian itch. I have also seen Portuguese physicians use it but I do not think it is a good medicine. Some people apply pounded cloves to the head, and say that they find it good for headaches.

He continued:

> Women are much addicted to chewing cloves to make the mouth smell sweet, and not only Indian women but also Portuguese.[25] (Orta 1913: 213-222).

Attesting to his intellectual independence, he corrected the errors about the clove tree diffused by the texts in circulation. All this new and old information, collected, analyzed and validated by Orta, was spread within the Iberian Empires by the *princeps* edition of *Colóquios dos Simples*.

Garcia de Orta's legacy

A wider circulation of Orta's work was assured by the various editions of Clusius' Latin epitome, *Aromatum et Simplicium*, published in Antwerp in 1567.

During his journey in Iberia (1564-1565), Clusius encountered Orta's volume recently arrived from Goa. As Florike Egmond recently affirmed «Clusius gave the *Colóquios* a complete makeover». In this Latin epitome, Clusius

[25] In India cloves were used for their aromatic and disinfectant qualities. They were used in daily cuisine, medicine — especially to sweetened breath — and perfumery.

FIGURE. 3. With *Aromatum et simplicium*, Clusius spread the news of Asian spices, drugs and natural products described by Garcia de Orta across Europe. Clusius presented the first true image of the clove's flower buds, leaves and fruits (BNP RES 4108 P).

removed the dialogue form, re-arranged the order of the topics, included woodcut illustrations, added new comments and a detailed index. He added the «true images» of Asian spices and drugs, but only from those that he received from friends and travelers or could find at the Antwerp market. This completely revised treatise described the Asian natural world to European readers, as observed and tested by Orta. By the end of the 1560's European scholars had, at last, access to a modern narrative about the Eastern drugs and spices. The book was a great success, reflected by the several editions, versions and commentaries that had been published by the beginning of the seventeenth century.[26]

However, in 1578 a new treatise on Asian botany was published in Burgos: *Tratado de las Drogas*.[27] The author was Cristóvão da Costa, who had travelled to India in 1568, as the private physician of D. Luis de Ataíde (g. 1568-1571) and was subsequently appointed doctor at the Royal Hospital of Cochin [Hospital Real de Cochim]. Like Orta, his remarkable ability to communicate with local people and to observe other medical practices enabled him to write a completely new treatise on Asian plants

[26] On Clusius's life and botanical work, see: Wille (1993: 109-121) and Egmond (2006). On his apropriation of Orta's text, see: Lopes (2006: 10-27); Ogilvie (2006, 193-203); Kusukawa (2007, 221-246); Costa and Carvalho (2013: 1-13) and Egmond (2015: 167-194).

[27] On Costa's *Tractado* see: Mathew (1997: 369-376). Another treatise on Asian natural resources, *Discurso de las cosas aromaticas* was published in 1572, by the Royal physician Juan Fragoso. However, Fragoso's volume did not add any new information on cloves. On these Spanish treatises: Carvalho (2011: 59-72) and Pardo-Tomas (2015: 195-211).

and drugs. Although he was very fond of Garcia de Orta's work and personality, he corrected some inaccuracies and also added some new Eastern plants used in local medicine. His treatise provided the first printed illustrations of Asian trees, flowers, herbs, fruits, drawn firsthand by a European observer. A total of 47 images of Indian drugs and spices were depicted directly from the subject, such as: cinnamon, pepper, cloves, nutmeg, ginger, galangal, tamarind and China-root. With Cristóvão da Costa's publication, Europe became aware of the image and character of the clove tree. It seemed that, at last, European scholars had the information about cloves and other drugs and spices they had been so anxiously waiting for. In chapter III, «De los clavos y de su planta», Cristóvão da Costa was faithful to Orta's depiction of the tree. In the chapter he also included an image of a clove tree and the names of the spice in several European and local languages. Costa contradicted Orta's description in just a small detail that compromised his reputation as a trustworthy observer: in the topic «Clavo como nasce», he affirmed:

FIGURE 4. «Clavo» — Cristóvão da Costa provided the first illustrations of the clove tree drawn by a European observer (BNP RES 4055P).

> [El clavo] Nasce por las proprias ramas como los higos, y los menos dellos por los pieds de las hojas: salen de un pie dos, tres y quatro juntos: y a vezes uno (Costa 1578: 31).

As we will see, this simple remark had consequences among the scholarly community.

During his journey to London, a friend offered Clusius a special gift: a recently published volume of *Tractado de las Drogas*. Searching in Costa's treatise for new reports on the plants of Asia, the initial intention of the botanist was to publish a Latin version of the book. But he soon became disappointed with this promising volume. Not only because of the large amount of text

«copied» from Orta's *Colloquies* but also because of the «errors» of the descriptions and the inaccuracy of the illustrations.[28]

In the Latin version of Costas' treatise published in 1582, Clusius wrote:

> Contrary to the opinion of the other authors who have written on cloves, he [Costa] asserts that they grow from the branches among the leaves. I thought it worthwhile to present this claim to the reader, in order to show how little faith this writer deserves at times.

In *Tractado de las Drogas*, Costa revealed to be a keen observer of Asian nature. It seems to me highly improbable that he committed such a careless error in his depictions of the clove tree. Apparently, flowers of the clove tree grow like myrtles and not as figs. Why did Costa introduce this botanical error in his depiction? Was it a simple mistake? Was he wrongly informed? Or, could this *error* have other meaning?[29]

And Clusius' criticism continued:

> The illustrations that the author [Costa] boasts are drawn from life, have been eliminated, since they were clearly inept and do not depict real plants, this can be seen from the effigy of the clove tree, which I left in that it might be compared with the true image in my epitome of Garcia.

The inexactness of Costa's botanical descriptions disenchanted the scholar. Referring to his own illustration of cloves Clusius stated:

> In my version of Garcia's history of aromatics, I certainly gave a legitimate image of cloves, drawn by a diligent, skilled artist from a pickled branch of the tree

[28] For a recent insight into Clusius' view on *Tractado de las Drogas*, see: Ogilvie (2006: 244-248); Egmond (2015: 167-194). For an in-depth reflection on the role of images in botanical treatises see: Kusukawa (2012: 98-177); Givens, (2006: 115-146) and Swan (1995: 353-372).

[29] During his lifetime, Cristóvão da Costa published three books. The first, *Tractado de las Drogas* (Burgos, 1578) was classified as a «scientific» text. Later, in 1592, Costa published, in Venice, two other volumes: *Tractado en loor de las mugeres* and *Tractado en loor de la vida solitaria*. Both treatises have been analyzed by their «moral» content. In my opinion this strict dichotomy between «science» and «moral» can compromise our understanding of Costa's representations of the Creation. To a deeper perception of Costa's narrative, it seems that his printed work should be revisited and analyzed as a whole.

> (many of which are brought to Antwerp). Furthermore, I saw nine-inch and twelve-inch branches of cloves, brought back from the Moluccas last September by Francis Drake, an English sailor who circumnavigated the world.

During the following decades an immense mass of information, specimens and seeds of tropical plants flooded European cabinets and gardens. A new methodology for the construction of knowledge of the natural world was put to the test.

A new beginning

By the end of the sixteenth century, a completely revised knowledge of Asian spices, namely on cloves, validated in Goa had been disseminated and accepted by the European scholarship. Following the publication of Orta's Latin epitome, new herbals and encyclopedias included his new information on Eastern plants. This was the case with Andrea Cesalpino's *De plantis libri XVI* (Florence, 1583), Jacques Dálechamps' *Historia Generalis Plantarum* (Paris, 1586-1587), John Gerard's, *Herball* (London, 1597), Clusius', *Exoticorum libri decem* (Leiden, 1605), Jean de Moulins' *Histoire Génèrale des Plantes* (Lyon, 1614) and Caspard Bauhin's *Theatrum Botanici*, (Basel, 1623). A new methodology for the construction of natural knowledge was put to the test and, at last, an innovative discourse about the resources of the Indies emerged in Early Modern Europe.

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