


From the Americas to the Philippines. The travels of the pineapple: a sixteenth-century globe trotter

De América a Filipinas. Los viajes de la piña: una trotamundos del siglo XVI

Teresa Nobre de Carvalho
CHAM, Faculdade de Ciências Sociais e Humanas, FCSH
Universidade NOVA de Lisboa, 1069-061 Lisboa
tercarvalho@gmail.com
<https://orcid.org/0000-0002-5294-4068>

 Foundation

[DOI: 10.24901/rehs.v44i174.1010](https://doi.org/10.24901/rehs.v44i174.1010)

[From the Americas to the Philippines. The travels of the pineapple: a sixteenth-century globe trotter](#) by [Teresa Nobre de Carvalho](#) is licensed under [CC BY-NC 4.0](#) 

Fecha de recepción: 21 de abril de 2023
Fecha de aprobación: 4 de julio de 2023

ABSTRACT:

Originating in South America, the pineapple -*Ananas comosus* (L.) Merr.- underwent a lengthy domestication process. Since ancient times, the Native Americans had taken it with them on their migrations and valued the sweetness of its pulp, its medicinal properties, and the quality of its fibre. Much later it was described by Spanish chronicles in Central America and observed by European travellers and missionaries along the Brazilian coast. From the 1560s, the fruit was transported by the Portuguese from Brazil to East Africa and the West coast of India, and from here it was later transferred to other parts of Asia. In the 1580s, the Spanish introduced the species into the Philippines from the New World. This work focuses on the importance that pineapple cultivation has attained in the tropics, especially in the Philippines; it highlights the success that fabrics and embroidery made from fibres extracted from the pineapple achieved in the late sixteenth century; it demonstrates how the introduction of a foreign vegetable species into the Philippines has today resulted in an industry that supports local farmers in the sustainable production of raw materials, providing a means of production for artisans in the region and contributing to the success of a circular economy on a global scale.

Keywords: *Ananas comosus* (L.) Merr, pineapple fibre, plant circulation, biodiversity, sustainability, circular economy, New World

RESUMEN:

Originaria de América del Sur, la piña -*Ananas comosus* (L.) Merr.- pasó por un largo proceso de domesticación. Desde la antigüedad, los nativos americanos la habían llevado consigo en sus migraciones y valoraban el dulzor de su pulpa, sus propiedades medicinales y la calidad de su fibra. Mucho más tarde fue descrita por crónicas españolas en América Central y observada por viajeros y misioneros europeos a lo largo de la costa brasileña. A partir de la década de 1560, los portugueses transportaron la fruta desde Brasil hasta el este de África y la costa oeste de la India, y desde aquí se trasladó más tarde a otras partes de Asia. En la década de 1580, los españoles introdujeron la especie en Filipinas desde el Nuevo Mundo. Este trabajo se centra en la importancia que ha adquirido el cultivo de la piña en el trópico, especialmente en Filipinas; destaca el éxito que alcanzaron los tejidos y bordados elaborados con fibras extraídas de la piña a fines del siglo XVI; demuestra cómo la introducción de una especie vegetal extranjera en Filipinas ha resultado hoy en una industria que apoya a los agricultores locales en la producción sostenible de materias primas, proporcionando un medio de producción para los artesanos de la región y contribuyendo al éxito de una economía circular en una escala global.

Palabras clave: *Ananas comosus* (L.) Merr, fibra de piña, circulación de plantas, biodiversidad, sostenibilidad, economía circular, Nuevo Mundo

Overview

Descriptions of the flamboyant pineapple -*Ananas comosus* (L.) Merr- had featured in the records of Europeans from their very first experiences in the New World.¹ The incomparable aroma and flavour of this American fruit impressed voyagers, missionaries, and sailors alike. From the islands of Central America, to continental South America and along the Brazilian Atlantic coast, voyagers and chroniclers extolled the virtues of fresh pineapple. However, it was slow in reaching Europe as pineapples would rot during the lengthy ocean crossings. Therefore, this flavoursome fruit would only make it to the Old World in the form of a conserve, which was recognised for both its undeniable sweetness and its therapeutic qualities.² In contrast, missionaries and navigators were much more successful in transferring the species to other tropical and subtropical lands, where it quickly became naturalised. From Brazil, *A. comosus* spread to the coast of Africa, to India, the Mughal Empire and China. In all these lands, the pineapple found the conditions it needed to thrive and was particularly enjoyed when eaten fresh.

The major exception to this rule was the Philippines. When the pineapple was taken to the Philippines by the Spanish, it did not find the agroecological conditions it needed to produce fruit of a quality comparable to that of the Americas. However, as [Montinola \(1991, p. 12\)](#) writes:

“when pineapple grew successfully [in the Philippines], the natives, who were already skilled in weaving fabrics from such plants as cotton, abaca, Palma and plantains, were predisposed to consider it as another source of fibre”. Missionaries and settlers, who had quickly noticed the Filipinos’ skill when working with abaca (*Musa textilis* Née), cotton (*Gossypium* L.), and coconut (*Cocos nucifera* L.) fibres, encouraged the introduction and cultivation of fibrous pineapple varieties in the region, such as the one today known as *Red Spanish*.

In just a few decades, the use of pineapple threads, skilfully extracted from the leaves of *A. comosus* and then spun and woven by indigenous women, would become one of the region’s most important handicrafts. By the seventeenth century, shawls, *pañuelos* and other fine “piña” embroidery would be in great demand amongst the elites of the New World.³ Over the centuries, the use of garments made from pineapple fibres would take on an important symbolic and political role in the archipelago. In more recent times, the future of this tradition has been thrown into doubt due to the high production costs for farmers, the significant environmental impacts of its cultivation and the labour-intensive nature of the weaving and embroidery work. Currently, new applications for products manufactured using pineapple fibres and new uses for the waste generated by pineapple cultivation are reviving the importance of this age-old skill.

The present essay is based on analysis of voyagers’ letters, chronicles, natural histories, missionary correspondence, and reports by royal agents. It is divided into three sections: the first analyses the biological origins of *A. comosus* and the long process of domestication that this species underwent at the hands of the indigenous peoples; the second reveals the impact that this extraordinary fruit’s appearance and flavour had on the first European voyagers and explorers and describes the long ocean crossings that the species made from its centre of origin and diversity to the different lands the Iberians had contacted. The final part analyses the arrival of the pineapple in the Philippines and how new ways of exploiting the pineapple were developed in the archipelago. The article ends by illustrating how these novel ways of exploiting pineapples have impacted on Philippine producers and artisans of today. This approach allows us to uncover the past, but also envision a promising future for local populations, through the sustainable use of the species.

***Ananas comosus*: origin, use, and diffusion**

Over the last few decades, there has been a significant increase in research into where plants were first domesticated and cultivated.⁴ Until recently, studies on plant domestication and the identification of their respective centres of origin had been based on the analysis of seed-bearing species. However, new analysis methodologies, particularly in research on phytoliths and genetic mapping, have made it possible to study other plant species and provide new data which cast doubt over previous evidence regarding the beginnings of agricultural activity.

Alongside the Congo Basin and the Fertile Crescent, the Amazon region is today believed to have been one of the cradles of agriculture.⁵ The numerous ceramics remains (c.7000 BC), evidence of significant anthropogenic impact on soils and topographical changes in the vast lands of Brazil suggest that cultivation had begun millennia before contact with Europeans was

made. Recent studies indicate that when the ships from the Old World first arrived, the indigenous peoples were using about 138 plant species. Of particular interest to the recently landed voyagers were cassava (*Manihot esculenta* Crantz), capsicums (*Capsicum spp.*), sweet potatoes (*Ipomoea batatas* (L.) Lam.), corn (*Zea mays* L.), and pineapples, amongst others ([Coppens d'Veckenbrugge and Duval, 2009](#)).

Throughout the sixteenth century, many plants of the Americas were taken to other tropical areas.⁶ The adaptability of the pineapple allowed it to acclimatise to the conditions of several tropical and subtropical regions. In this way, *A. comosus* branched out from its home in the interior region of Brazil-Paraguay and underwent, like many other plants, a long and singular process of domestication.⁷ Indeed, the indigenous populations' own interest in *A. comosus* explains why the pineapple had already made the long journey from the Amazon basin to the faraway coastal areas of Brazil and the Caribbean by the time the first Europeans had arrived there. In fact, the Carib peoples had brought this fruit to the region in around 200 BC and it was grown widely there.⁸ This delicious and aromatic fruit, which Columbus' crew came across in the Caribbean and members of the Magellan-Elcano fleet tasted in Brazil (as related by Antonio Pigafetta), was therefore the result of a long domestication process conducted by the indigenous peoples.⁹ Therefore, we can conclude that this species had long accompanied the indigenous peoples on their migrations and was valued for its aroma, the sweetness of its pulp, its nutritional value, its potential as a textile and its medicinal properties.¹⁰

Europe meets the pineapple

Transferring the pineapple to Europe would require learning what techniques were needed for its successful cultivation. The first written reference to the pineapple had been provided by Michele da Cuneo (1448-1503). Hailing from Savona in Italy, da Cuneo was part of the "crew" who accompanied Christopher Columbus on his second Atlantic crossing.¹¹ In a letter addressed to a friend (24 October, 1495) he describes his visit to the island of Santa María de Guadalupe.¹² Among the list of fruits in his letter is the first reference to the pineapple.¹³ According to Peter Martyr d'Anghiera (1457-1526), a Milanese scholar serving in the Castilian court,¹⁴ one of the few fresh pineapples that made it to Seville was taken to the Royal Court for the appreciation of King Fernando II of Aragón. He wrote: "This fruit, *which the king prefers to all others*, does not grow upon a tree but upon a plant, similar to an artichoke or an acanthus" ([Martyr d'Angleria, 1912 \[1516\]](#)).

Years later, Gonzalo Fernández de Oviedo (1478-1557), one of the most distinguished chroniclers of the West Indies, described the extraordinary sensory attributes of this fruit, which he named "piña" due to its resemblance to the pine cone.¹⁵ Oviedo was author of *Sumario de la Natural Historia de las Indias* (1526) and of the *Historia General de las Indias* (1535). Widely known as the "Pliny of the Indies", he devoted much of his work to describing the natural riches of the "Indias, islas y tierra-firme".¹⁶ Oviedo was a keen observer of the American peoples, landscape, fauna and flora. He referred to three varieties of pineapples which were prized by the indigenous populations. The different qualities and morphologies of *A. comosus* that he

identified in the *yayama*, *boniama* and *yayagua* varieties reflected the features most valued by the different indigenous populations.¹⁷

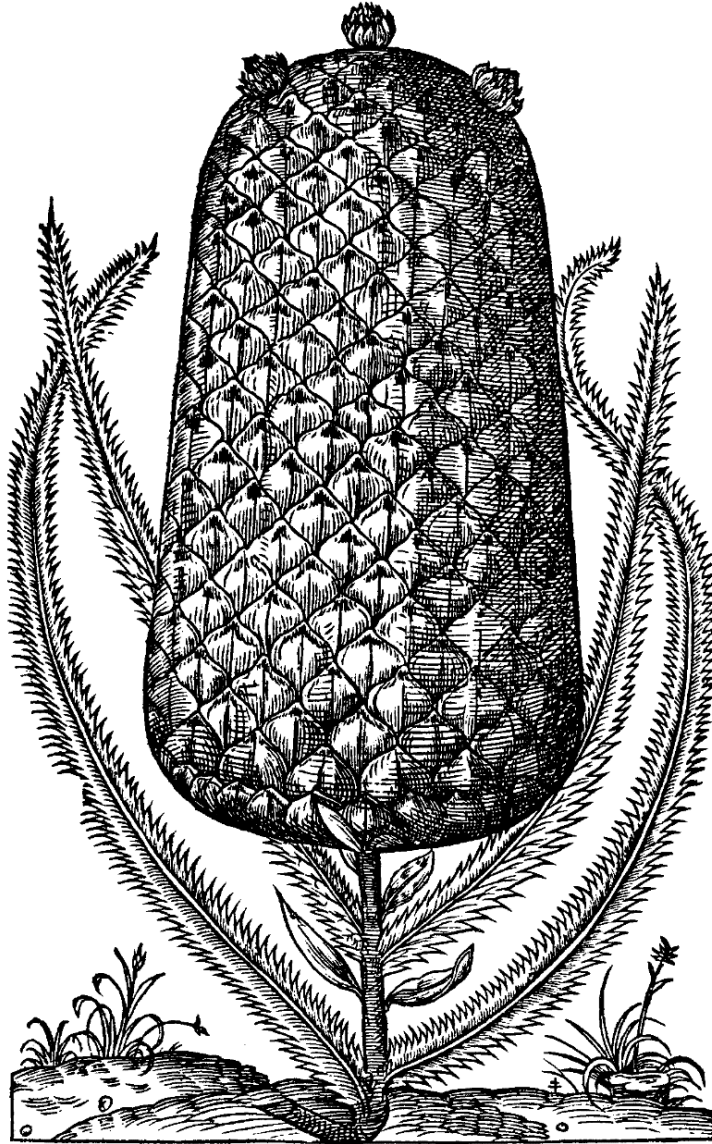
The Spanish settlers had a particular liking for the *yayama* variety and attempted to send fresh pineapples of this variety back to the Kingdom on several occasions. However, by the time it arrived in Europe, it was no longer edible. Realising that they would rot during the journey and, if they were cut while still unripe, would lose all their flavour, [Oviedo \(2007 \[1535\]\)](#) suggested that their crowns be rooted in the soil of the Indies and then transferred, after three or four months, to the soil of Andalusia where, like corn, they might grow.¹⁸ These attempts to cultivate the pineapple in Spanish soil would prove unsuccessful as the plant's agroecological needs could not be met in the Iberian Peninsula. It was only in the mid-seventeenth century, with the development of forced cultivation techniques, that growing pineapples in Europe became viable. For this reason, pineapple consumption in Europe was limited, for many decades, to aristocrats and the wealthiest of society.¹⁹ In contrast, the pineapple had spread widely in the tropical world and, since the mid-sixteenth century, had become accessible to members of all social strata.

From Brazil to China: Pineapples as food, medicine & refreshment

The first graphic report referring to this Brazilian fruit was provided by André Thevet (1516-1590), a missionary who embarked for Brazil in 1555. He was the chaplain of the fleet that left Europe under the command of Vice-Admiral Nicolas Durand de Villegagnon (1510-1571), an experienced navigator who landed on the coast of Brazil with the aim of establishing there the “France Antarctique”.²⁰

Thevet, who only stayed in the region for a short period, was the author of important cosmographic works, such as *Cosmographie de Levant* (1554) and *Les Singularitez de la France Antartique* (1557). In the latter, he describes the Brazilian natural world, peoples and landscape and presents several vegetable species valued locally for their dietary and medicinal uses. In addition to the pineapple, Thevet mentions other “new” plants used by the Tupinambá, such as manioc (*Manihoc esculentus* Crantz), peanuts (*Arachis hipogea* L.) and tobacco (*Nicotiana tabacum* L.).²¹ In Thevet's description, the pineapple is referred to by its local name “nana”, with a focus on its medicinal properties: “The fruit which they commonly eat when sick is named Nana”²² ([Thevet, 1568, p. 72](#)). [See [Figure 1](#)].

Figure 1. The first printed image of a Brazilian pineapple appeared in Thevet's *Singularitez de la France Antarctique* (1557)



Source: André Thevet
(1557). https://commons.wikimedia.org/wiki/File:Nana_Thevet_1557_89v.png

As noted above, the medicinal qualities of the fruit were highlighted by many other Europeans who visited or settled in this region of South America throughout the sixteenth and seventeenth centuries.²³ Like Thevet, the protestant missionary Jean de Léry (1534-1611) visited the Brazilian region.²⁴ In 1578, he published an account of his experience in Rio de Janeiro and in *Tupinambá* territory in the Guanabara Bay region. Entitled *Histoire d'un voyage fait en la terre du Bresil*, the volume contains observations from his time spent there. On the pineapple, he writes:

Quant aux plantes et herbes, dont je veux aussi faire mention, je commenceray par celles lesquelles, à cause de leurs fruict et effects, me semblent plus excellentes. Premièrement la plante qui produit le fruict nommé par les sauvages *Ananas*, est de figure semblable aux glaieuls, et encores ayant les fueilles un peu courbées et cavelées tout à l'entour, plus approchantes de celles d'aloës... (Léry, 1578, pp. 211-212).

Léry does not clarify about what “excellent effects” he is referring to. However, his description suggests that he witnessed the local use of the fruit in some kind of healing practice.

The Society of Jesus had arrived in Brazil by the end of the 1540s and played a major role in providing descriptions of the peoples and natural world of the region. Encouraged by the founding priests to report on the world they encountered, the missionaries would periodically send detailed information to their superiors about Brazilian plants and animals, as well as the uses that the indigenous peoples gave to them.²⁵ Much of this information circulated within the Society, but some of it aroused the interest of the most curious and wealthiest Europeans. This led to its publication in Venice and, from the 1560s onwards, it was widely disseminated.²⁶

The pineapple was first mentioned in Jesuit correspondence in the early 1560s by Father Manuel da Nóbrega SJ (1517-1570). Nóbrega was the first Provincial of the Jesuit Order in colonial Brazil. In a letter addressed to Father Henriques²⁷ he sends jars of pineapple conserve and marmalades made from tropical fruits. It was through this letter that, in Europe, the Jesuits became aware of the medicinal qualities of these preserved fruits: “The master takes these preserved fruits for the patients, the ananases [pineapples] for kidney stones; though the ripe ones do not have such virtues as the unripe, they are nonetheless still of use. The Brothers recovering from this illness would do well to come here for the treatment received” (Manuel da Nóbrega in [Cunha, 1978, p. 50](#); [Leite, 1955, pp. 377-378](#); [Carvalho, 2020](#)).²⁸

Two years later, Father Juan de Polanco sent, from Trent (Italy), a letter to Father Gonçalo Vaz de Melo (Provincial of Portugal). It should be noted that, between 1545 and 1563, Trent was the centre of the Catholic world and it was here that an ecumenical council was held that led to the emergence of the Counter-Reformation movement. Despite the importance of the subjects under discussion in the council, information regarding the therapeutic qualities of tropical fruits featured prominently in their correspondence. In fact, Polanco's missive specifically mentions some of the information shared by Nóbrega and reveals an interest in testing the qualities of preserved pineapple. Regarding these exotic conserves, he writes: “Manuel da

Nóbrega talks of certain preserved foods for those with kidney stones and calls them ananazes [...]. When you have the opportunity to send some of these things to these parts to assess their effectiveness, we would be happy to test them ourselves” (Juan de Polanco in *Monumenta Brasiliae, 1956-1958, pp. 541-46; Carvalho, 2020*).³⁰

We know, then, that from 1563 onwards, news of the medicinal properties of pineapple conserves circulated around the Society of Jesus.³¹ The reports of chroniclers and religious men describing the characteristics of this American fruit, combined with the information on its therapeutic properties, could have encouraged its transportation from Brazil to other tropical regions.

During the 1560s, no other Portuguese source referred to the pineapple. In fact, the first description in a printed Portuguese source only appeared in *História da Província de Santa Cruz* (1576). The author was the chronicler Pedro Magalhães Gândavo (c.1540-c.1580), a man who undertook administrative duties in Bahia between 1558 and 1572. The *História* was clearly a form of propaganda, aiming to encourage the Portuguese to settle in Brazil and thereby aid its colonisation.

A keen observer of the natural world, Gândavo describes the natural riches of this vast South American territory and refers to the large-scale cultivation of pineapples by the indigenous peoples. When Gândavo writes “they all do so much for this fruit that they have them plant it over large areas, like cardoons...”, he appears to suggest that by the 1570s, colonisers or missionaries had organised the work of the *Tupinambá* that lived in the villages with a view to large-scale pineapple production.³²

These villages, which were home to the indigenous peoples who had converted to Catholicism, made it easier to organise and administer the missions created by Society of Jesus missionaries. However, the missionaries were not particularly attentive to the diverse backgrounds and cultural traditions of these peoples.³³ According to *Gândavo (1922)*, these pineapples might have been consumed fresh by both the *Tupinambá* and the Portuguese posted there used to supply the ocean-crossing ships with fresh food or used to produce conserves. The chronicle also refers to a fermented drink made from pineapple juice that left the indigenous people “drowsy” due to its high alcohol content.³⁴

Some years later, the Portuguese farmer Gabriel Soares de Sousa (c.1540-c.1591) also mentions the pineapple in Brazil. Soares de Sousa set up sugar mills there and became vastly wealthy through agriculture and prospection. He later recorded his memories and observations of the natural world, peoples and treasures of Brazil in a volume known as *Tratado Descritivo do Brasil* (1587).³⁵ In this book, Soares de Sousa reveals strong observational skills and a profound curiosity for Brazil’s lands, peoples and produce. Regarding pineapples, he writes: “The natural habitat of this fruit is hot and humid and very harmful for anyone with a wound or an open sore, [...] when they are ripe, the Indians make wine with which they get drunk, so they harvest them when they are less ripe in order to be sourer than wine; [...] a lot of preserves are made from this fruit, with the skin removed, which is very beautiful and tasty...” (*Soares de Sousa,*

[1989\[1587\], pp. 133-134](#)).³⁶ In his description, he alludes to the qualities of the fruit and emphasises the healing properties (according to the Humoral theory)³⁷ and mentions the importance of the local production of a “wine” made from fermented pineapple juice.³⁸

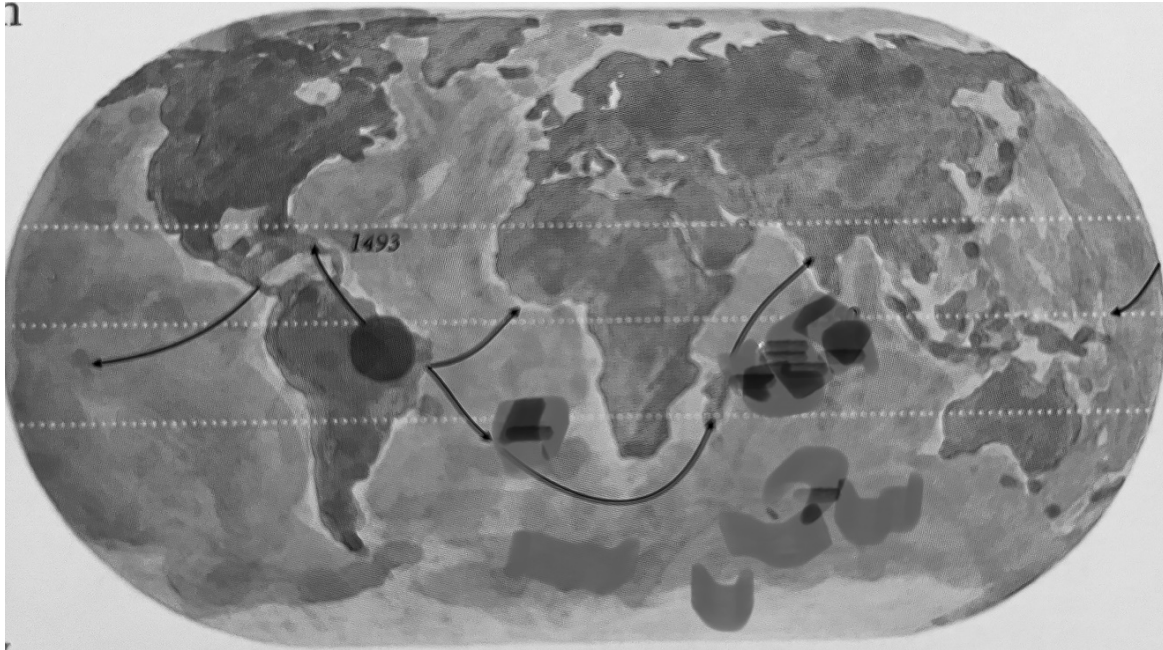
The medicinal qualities of pineapples were also recorded in other Brazilian reports, such as the *Drake Manuscript* (c. 1586) or the *Treatise of Brazil written by a Portugall who had long lived there* (c. 1601), published by Samuel Purchas.³⁹ Decades later, in the 1600s, Friar Cristóvão de Lisboa refers to the pineapple as “the best fruit on this Earth when ripe” in *História das plantas e animais do Maranhão* (c. 1624). He also alludes to the vast quantity of pineapples in the region, “in the bushland and along the rivers” ([1967 \[1624-1627\], p. 105](#))⁴⁰, emphasising its nutritional and medicinal qualities, as well as its abortifacient effect when consumed unripe by pregnant women (Blanco, 1845).⁴¹

Like other fruits from the tropics, the pineapple demonstrated great aptitude for adapting to tropical and subtropical ecosystems. The fruit was very popular amongst the Portuguese who settled on both sides of the Atlantic.⁴² Rich in sugar, water and vitamins, the pineapple probably became part of the crews’ onboard diet. Apparently, pineapple crowns were left to take root when ships made stopovers for technical reasons or provisions, thereby making it possible for other *Carreira da Índia* ships to replenish their pineapple supplies when passing by on subsequent voyages.⁴³ This is likely how the pineapple rapidly branched out from Brazil and propagated around the Atlantic, on the island of Santa Helena and the coastal regions of southern Africa.⁴⁴ In the early 1560s, the species was taken to the west coast of India, from where it would later spread around the East. It was in this way that the fruit was successfully transferred from Brazil to modern-day Angola, Mozambique, Zanzibar, India, Malaysia, and China ([O’Connor, 2013](#)).

This circulation around the Americas and Asia was primarily driven by the consumption of fresh pineapple. Although when it arrived in a new land the fruit was regarded as rare and valuable, its rapid acclimatisation to the agroecological conditions found in the tropics further east meant that it soon became considered “local produce”, as would happen with other fruits originating in the Americas. Thus, by the late 1570s, American produce such as pineapples, cashews (*Anacardium occidentale* L.) and peanuts (*Arachis hypogea* L.) had become an everyday commodity for the Portuguese and local populations in Goa, Cochin and Bassein, alongside mangoes (*Mangifera indica* L.), jackfruit (*Artocarpus heterophyllus* Lam.), rose apples (*Artocarpus heterophyllus* Lam.), mangosteen (*Garcinia mangostana* L.), watermelons (*Citrullus lanatus* [Thunb.] Matsum. & Nakai), sweet oranges (*Citrus sinensis* [L.] Osbeck) and other Asian fruits.

At the end of the following decade, the pineapple was brought by the *franges* (as Europeans were known in the East) to the distant Mughal Empire. It soon filled the tables and imperial gardens of Agra and its taste and aroma were greatly appreciated by emperors Akbar (1542-1605) and Jahangir (1569-1627).⁴⁵ [See [Figure 2](#)].

Figure 2. The transfer of *Ananas comosus* in the sixteenth century



Source: Author's adaptation from [Ferrão, 2015, p. 57](#).

As the Portuguese made their way through the vast tropical world, the pace at which Asian, African, American, and European fruits and vegetables spread was dictated by how quickly they advanced. As the pineapple was naturalised in far-off lands, it also gradually acquired new attributes.⁴⁶ Along the African coast and across Asia, the pineapple was widely consumed and depicted. Likewise, in Europe and its imperial possessions, the fruit and its image also left their mark. In addition to enriching diets and providing new medicinal remedies, the fruit began to be employed as a decorative motif on a variety of different surfaces. In convents, churches and other places of Catholic worship, the image of the pineapple cropped up on columns and capitals alongside the traditional acanthus leaves and shells. The pineapple was also depicted on porcelain, textiles, furniture, and valuable objects, thus revealing the profound interest and curiosity that it aroused amongst Europeans. [See [Figure 3](#)]. Finally, the frequent references to pineapples in travelogues, correspondence and Natural History treatises and its depiction on maps is indicative of the importance that it had achieved amongst Europeans from the 1500s onwards.⁴⁷

Figure 3. Round plate in Chinese porcelain, exported to the West, decorated in cobalt blue. China, eighteenth century



Source: Pharmacy Museum, Lisbon. No. Inv. 10794

Transfer of the pineapple to the Philippines: the discovery of a new textile source

When the Spanish reached the Philippines, they soon began introducing European, Asian, and American plants into the archipelago. Some American fruits were the subject of a significant production effort. Notable among them are the pineapple, guava (*Psidium guajava* L.), avocado (*Persea americana* Mill.) and other species with medicinal applications, such as tobacco (*Nicotiana tabacum* L.).⁴⁸

By the end of the 1570s, numerous handwritten and printed reports on the flora and fauna of the New World were already in circulation. These texts gave particular emphasis to plants and animals which had a medicinal use, could be eaten or used as dye or as a source of fibres. While some of this information remained handwritten, in other sources, such as the chronicles and histories of Gonzalo de Oviedo, López de Gomara, Friar Bernardino de Sahagún and, especially, *Historia Medicinale* by Nicolas Monardes, there is a good deal of information about the dietary and therapeutic qualities of the American natural world.⁴⁹ In Monardes volume, we read: "...They take them [pineapples] to be good for the *stomache*, and likewise for the *hearte*, and to restore the appetite lost; it is a *generall fruite* in all *partes* of the Indias, and much esteemed. They are to be eaten at the beginning of meale. They use to eat them in the hot after soones; for they say that they do refresh: they are cold in my judgment..."⁵⁰

Due to its properties, the pineapple features in all these sources describing Spanish colonial lands, where the fruit, served fresh or as a conserve, was much appreciated by the agents of Philip II. In the Philippine archipelago an alternative way of exploiting the species was identified. Here it was not so much for its fruit which, as we shall see, was shipped into the Philippines from abroad, but for its high-quality fibres, which local craftsmen and weavers learnt to use. This dual use of *A. comosus* (imported to be eaten fresh or produced locally for the extraction of its fibres) occurred in the Philippines, from the end of the 1500s.

Fresh pineapple consumption

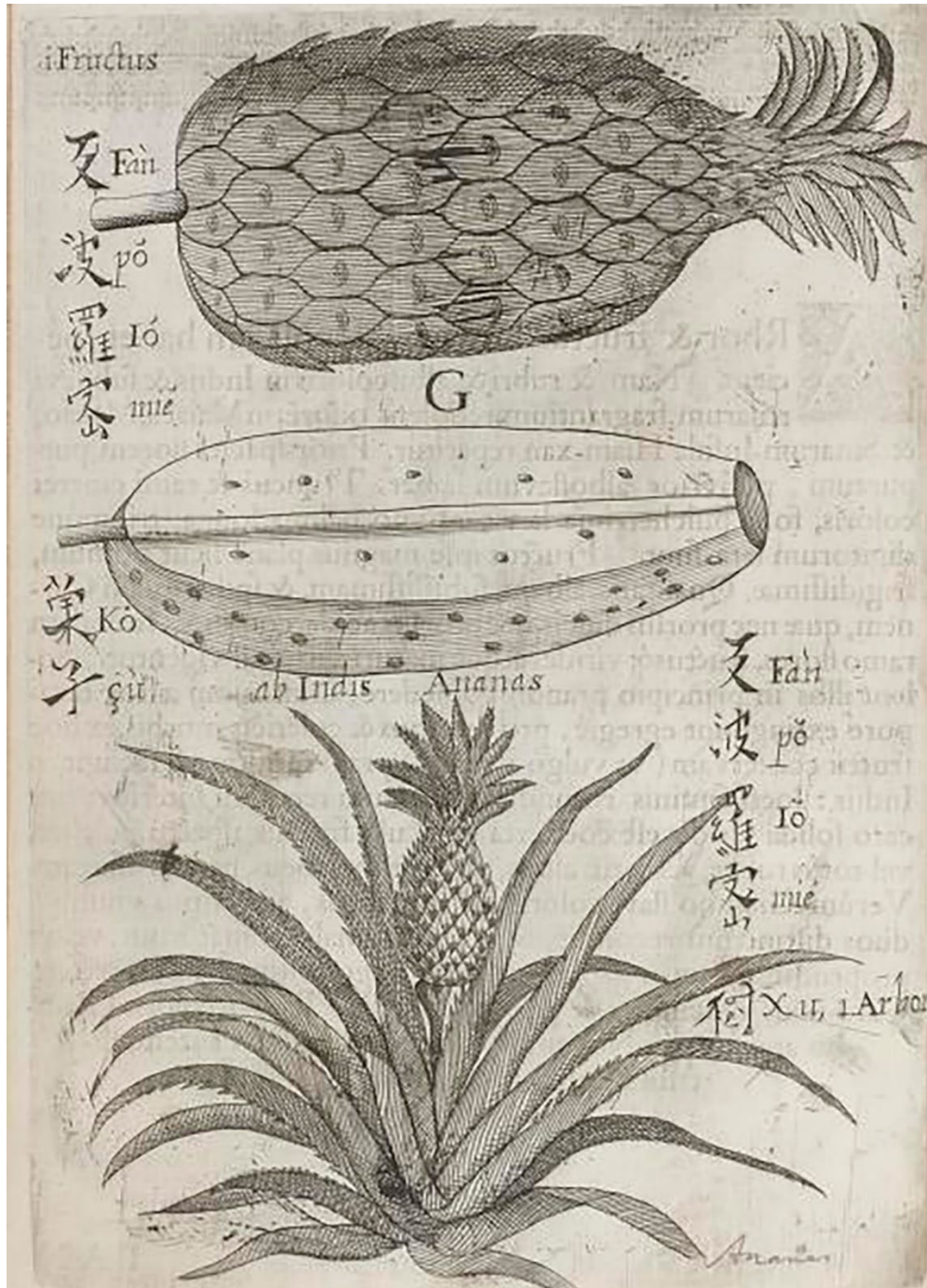
Although *A. comosus* could be grown in the Philippines, by the end of the sixteenth century, Filipinos and Spanish settlers continued to import the fruit from abroad. In a letter sent to Philip II on 27 June, 1588, D. Domingo de Salazar, the first Bishop of Manila, alludes to the diversity of produce that arrived in Manila from China every year, amongst which the pineapple featured prominently.⁵¹ The prelate's letter reads:

Twenty merchantmen generally sail hither each year from China, each one carrying at least a hundred men, who trade from November until May -in those vessels coming hither, living here, and departing to their own country. They bring hither two thousand pesos' worth of merchandise, only ten thousand pesos being in food supplies - such as flour, sugar, biscuits, butter, oranges, walnuts, chestnuts, pineapples, figs, plums, pomegranates, pear, and other fruits, salt, pork, and hams, -and in such abundance that the city [Manila] and its environs are supported thereby during the whole year.⁵²

This abundance of the pineapple in China suggests that it had been previously introduced there. How the plant made its way to China is not fully understood, but it may have arrived there via different trade routes. In his richly illustrated book on Chinese flora, Michal Boym (1612-1659), a Polish Jesuit who was sent on a Mission to China and arrived in Tonkin in 1647, claims the pineapple was transferred to China by the hands of the Portuguese.⁵³ In his wanderings around continental China, Boym collected a vast amount of information regarding

the region's flora and fauna. In *Flora Sinensis* (Vienna, 1666), he depicted the pineapple [*Fan-po-lo-mie*] as a naturalised plant that had rightfully become part of Chinese flora. [See [Figure 4](#)].⁵⁴

Figure 4. [M. Boym, *Flora Sinensis*. Wien, 1656](#)



Source: Royal Botanic Gardens Kew, Library, Art & Archives <https://www.biodiversitylibrary.org/bibliography/123322>

Years later, Atanasius Kircher (1602-1680) argued that the pineapple had arrived in China from Peru.⁵⁵ This scholar was one of the most erudite priests of the Society of Jesus and had a broad knowledge of astronomy, physics, mathematics, botany, and other aspects of the natural world. He was the author of several works that reveal his deep interest in and knowledge of various scientific areas.⁵⁶ *China illustrata* (1987 [1667], p. 182) reads: “Among other things, it is unusual in being also found among the Americans and East Indians who call it *Ananas*, and among the Chinese who call it *Fam po lo nie*. There is a great supply of it in the province of Quantung, Chiamsi, and Fokien. It is thought to have been first imported to China from Peru”.

In fact, both scenarios of how the pineapple reached China are possible and, most likely, correct. On the one hand, contact between the Portuguese and the Chinese dated back to the mid-sixteenth century and, on the other, since the Spanish had settled in Manila, interaction between Spaniards and Chinese sailors, craftsmen and merchants had intensified. This led to an increased sharing of experiences and exchange of produce and knowledge.⁵⁷

Fibre extraction

In the sixteenth century, the Spaniards centred their administrative and mercantile activities on the island of Panay. It did not take long for the fertility of the islands to be noticed by Miguel de Loarca⁵⁸ who, in 1582, wrote the *Relacion de las Yslas Filipinas*, an extensive study on the archipelago. The large number of Chinese artisans and merchants amongst the local populations reveals the degree of cultural and commercial exchange that took place on the islands before the arrival of Europeans.

As mentioned, textile production was an ancient tradition in the Philippines and, in addition to working with fibres such as abaca (*M. textilis*), coconut (*C. nucifera* L.), cotton (*Gossypium* L.) or silk (produced by *Bombyx mori* Linnaeus, 1758), Indian and Chinese cotton and silk cloth were used to make clothing.⁵⁹ As noted by chroniclers and scholars, the success of these products was brought about, in part, by a combination of the native populations’ textile skills, the European settlers’ encouragement of the activity, and the business initiative of the many Chinese who travelled across the region. In addition, the colonial imposition of tributes to the Crown - to be paid in kind, or with agricultural or manufactured products- may have led the local peoples to focus on weaving, an activity they had long mastered.⁶⁰

The initiative to promote the education and training of the local peoples was largely due to missionaries, probably to Friar Juan de Plascencia (1520-1590). This religious man left Seville in June 1577 and arrived in the Philippines in September of the following year.⁶¹ Before setting sail from the port of Acapulco, he spent a few months in Mexico. Once regular contact had been established between Manila and Acapulco, a large American region became “closer” to the Philippines and, from 1565 onwards, this regular maritime route allowed for an intensified cultural and human exchange.⁶² As mentioned, this transfer of plants, animals and people in both directions had an important social, cultural and agroecological impact and facilitated the dissemination of knowledge and practices, which could then be appropriated by different peoples.⁶³

Arriving in Manila, Friar Plascencia and Friar Diego Oropesa developed an extensive missionary campaign. They encouraged the setting up of primary schools where doctrine and the arts were taught. There, in addition to doctrine and writing, the education of the populations was extended to crafts, for which the indigenous peoples revealed a unique aptitude. It was the conviction of the missionaries that training the local populations and enhancing their skills could increase their worth as citizens of the empire.⁶⁴ Native girls that were used to working with vegetable fibres were encouraged to weave and embroider using new raw materials. The tasks of extracting, washing, spinning, weaving, and colouring the fabrics were carried out by Bisaya women due to the skill and dexterity they required. Later, in a letter sent in 1590 to Philip II, D. Domingo de Salazar highlighted the remarkable work of these women in the production of high-quality embroidery: “embroiders who are already producing excellent embroidered works and are continually improving their art...”.⁶⁵ Surpassing the delicacy of the finest European lace and embroidery further encouraged its production. [See [Figure 5](#)].

Figure 5. Pineapple-fibre handkerchief



Source: Brooklyn Museum Costume Collection at The Metropolitan Museum of Art, Gift of the Brooklyn Museum, 2009; Gift of Jean L. Keith in memory of Christine Keith, 1968 <https://www.metmuseum.org/art/collection/search/169865>

In addition to young Filipinas, Chinese immigrants known as *Sangleys* were also recognised for their skill in producing fine embroidery.⁶⁶ Indeed, it was not only religious orders which settled in the region, but also Chinese craftsmen. With a long tradition in the art of embroidery, they brought new techniques with them which resulted in works of great beauty and extraordinary originality. The use of *juzi*, as the locals referred to the silk brought by Chinese merchants, made it possible to produce light fabrics.⁶⁷ With this mixture of natural fibres, the challenge of acquiring seasonally-produced pineapple fibre on a consistent basis was overcome. The use of this technique would therefore appear to be the result of the transfer of cultural habits and plant material, local appropriations and reciprocal influences amongst the people who encountered each other, thanks to the regular ocean crossings at the end of the sixteenth century.⁶⁸

Brightness, texture, and transparency were sought-after attributes in cloth to be used in religious ceremonies and the demand for ever finer fabrics led to a greater investment in the production of lace and embroidery made from pineapple fibres - the most delicate vegetable fibre worked by Filipinos. So, while the themes and design were Hispanic, the raw materials, skill and craftsmanship were indigenous. Altar cloths, chalice, and other liturgical cloths, as well as many other delicate fabrics such as shirts, *pañuelos* and handkerchiefs would have been woven from pineapple fibre and then embroidered with cotton, silk, or pineapple fibres. At the end of the sixteenth century, these scarves, handkerchiefs and *pañuelos* commanded very high prices in Europe and only ladies of the highest social status could afford to display them alongside their gold, silver, and precious stone jewellery.⁶⁹

This important flow of people, practices and knowledge between China, the New World and Manila allowed for cultural and human exchange, permitted knowledge and practices to be transferred and local traditions to be appreciated and valued. Therefore, the adaptability of *Ananas comosus* led to a diversity of uses: in the opulent Caribbean and Mexico, the pineapple plant produced delicious fruit and sweet preserves; in the delicate Philippines, the use given to pineapple fibres, especially those extracted from the *Red Spanish* variety, revealed the refinement and sophistication of a region with great potential at the gates of China.

For Paulina Machuca, this new application for pineapple fibres in the Philippines resulted from a phenomenon she has named *transculturation*. This shows how the populations of the archipelago appropriated the use of this newly arrived plant species, exploiting it by employing practices they had long used with other species, such as abaca, cotton, or coconut. As referred, in Panay craftsmen were able to extract very fine fibres from pineapple leaves which, once they had been washed, dried in the air, and patiently spun, were woven on bamboo and wood looms, long used by the local people ([Bernal, 1965](#); [Cárcer and Disdier, 1995](#); [Machuca, 2016b](#); [Phipps, 2020](#)).

Over time, pineapple-based fabrics also took on a political value and contributed to the Philippine national identity. Currently, they are used in the manufacturing of haute couture dresses and traditional costumes. The latter, the *tagalog barong* and *baro't saya*, are used on formal occasions and at national festivals. The former is a long-sleeved men's shirt, woven and

embroidered using pineapple fibre. While it was traditionally only worn by men, it can, in certain circumstances, be worn by women as a sign of empowerment and political action. The latter, the *baro't saya*, is a long skirt, traditionally worn by women. The most valuable costumes are woven and embroidered entirely with pineapple fibre. However, given the high production, extraction, spinning and manufacturing costs, it can be made from other fibres, such as abaca, cotton, organza, or silk. These outfits came about through the fusion of pre-colonial and Spanish garments.⁷⁰

An old tradition with a sustainable future

Currently, bamboo looms and artisanal production techniques remain unaffected by the pressures of technological advances. Nevertheless, the highly time-consuming nature of the production of these fabrics and the poor financial return for craftspeople and agricultural producers have called into question the survival of this technique. However, the recent availability of new lines of financing aimed at safeguarding knowledge and techniques is a sign of hope for these craftspeople. An example of this is the support which has led to the creation of hybrid textile fibres such as “piña-abaca”, “piña-cotton”, “piña-silk”. These alternatives have contributed to the recovery of ancestral techniques, as well as protecting the jobs of pineapple producers and craftsmen.⁷¹

The prospects for these ancient techniques have also been boosted by increased awareness in the textile industry of the benefits of procuring products that, on one hand, are an alternative to using industrial fibres which have a substantial environment impact and, on the other, promote sustainable ecosystems and circular economy solutions.⁷² Such is the case of Piñatex®, a recently-patented product proving a great success in textile production aimed at home decoration, footwear and accessories.

Aware of the cultural changes that might influence their customers, the fashion and haute couture industries have also revealed a desire to change their ways and are increasingly seeking out “cleaner” raw materials. The creation of “environmentally-friendly” fashion products and accessories is a response to customers’ growing environmental concerns and promotes awareness amongst younger people of the urgent need to protect the biodiversity of natural ecosystems.

Similarly, Pinyapel®, a product obtained from organic waste created during pineapple production, is a paper and plastic substitute used in cardboard and containers. This new product is expected to have a major impact on the ready-to-eat and take-away industries and could also make a significant contribution to reducing the use of plastics and other more polluting packaging materials. Not only does it reduce the use of non-renewable resources, but, as a nutrient-rich substrate, it can also be reused in pineapple cultivation, thereby reducing its environmental impact and production costs.⁷³

Finally, against the backdrop of the pandemic, some artisans created individual protective masks woven from cotton and pineapple fibres and embroidered with silk thread. Although they are not a substitute for the authorised FFP2® masks, the beauty of these masks, which can

be placed over standard ones, has lessened the economic and social impacts that the pandemic has caused in the crafts industry. The future of any of these initiatives, which believe in the sustainability of pineapple production and the products associated with it, is, as we set out at the beginning of this research, largely based on local practices, and solidly anchored in an ancestral tradition.

More than five centuries after the first Europeans laid eyes on *A. comosus*, pineapple cultivation is widespread throughout the tropical and subtropical world.⁷⁴ Eaten fresh or from tins, it is also recognised today for its various culinary uses and important medicinal applications. These properties, which were understood by the indigenous peoples and disseminated by Europeans, can now be confirmed in laboratories. In addition, contact with different human societies led to innovative new uses of the pineapple which, in the case of the Philippines, proved to be of great economic, cultural, political and social importance.⁷⁵ Therefore, this global transfer of the pineapple and the movement of people across the whole world, which was so characteristic of the sixteenth century, had an impact on the diets, healing practices and cultural and social habits of the peoples of Europe, the Americas, Africa and Asia. The communities of each region found their own way of exploiting this “pilgrim” species, providing a good illustration of how the domestication, production, and consumption of *A. comosus* and its by-products gave rise to new interactions and adaptations in societies, economies, ecosystems, and environments on a global scale.

Acknowledgements

This research was possible thanks to the post-doctoral fellowship SFRH/BPD/119899/2016 of the Fundação para a Ciência e Tecnologia, and to the invaluable support of CHAM (Nova FCSH/UAc) through the strategic project sponsored by FCT (UIDB/04666/2020). I would like to thank Pedro Cardim, Rui Manuel Loureiro, Paulina Machuca, Maria João Ferreira, and Miguel Rodrigues Lourenço for their comments and suggestions. I also want to express my gratitude to the reviewers of the text for their remarks and to James Mapp for his help with the English version.

Bibliography

- AIRALDI, G., FORMISANO, L. (1996). *La scoperta nelle relazioni sincrone degli Italiani*. Poligrafico e Zecca dello Stato-Archivi di Stato.
- ALESSANDRINI, N. (2019). Antonio Pigafetta, cavaleiro do mar oceano. Uma reconstrução biográfica. *Anais de História de Além-Mar*, (XX), 61-80. https://research.unl.pt/ws/portalfiles/portal/18242833/Anais_XX_VersaoFinal_62_81.pdf
- ANAGNOSTOU, S. (2007). The international transfer of medicinal drugs by the Society of Jesus (sixteenth to eighteenth centuries) and connections with the work of Carolus Clusius. In F. Egmond, P. Hoftijzer & R. Visser (Eds.), *Carolus Clusius: towards a cultural history of a Renaissance naturalist* (pp. 293-312). KNAW.

- AVERY, V., CALARESU, M., LAVEN, M. (Eds.) (2015). *Treasured Possessions. From the Renaissance to the Enlightenment*. The Fitzwilliam Museum.
- BAUMHAMMER, M., KENNEDY, C. (2017). Merian and the pineapple: Visual representation of the senses. In D. Hacke & P. Musselwhite (Eds.), *Empire of the Senses: Sensory Practices of the Colonialism in Early America* (pp. 190-222). Brill.
- BÉNAT-TACHOT, L. (1997). Ananas versus cacao. Un exemple de discours ethnographique dans la *Historia General y Natural de las Indias* de Gonzalo de Fernandez de Oviedo. In B. A. Queija & S. Gruzinski (Coords.), *Entre Dos Mundos, Fronteras Culturales y Agentes Mediadores* (pp. 193-230). CSIC-EEHA.
- BERNAL, R. (1965). *México en Filipinas. Ensayo de una transculturación*. Universidad Nacional Autónoma de México.
- BERNAL, R. (2012). *El Gran Oceano*. Fondo de Cultura Economica USA. BOXER, C. R. (1950). A late sixteenth century Manila MS. *The Journal of the Royal Asiatic Society of Great Britain and Ireland*, (1/2), 37-49. <https://www.jstor.org/stable/25222372>
- BLAIR, E. H. (1903). *The Philippine Islands 1493-1898. Vol 7. (1588-1591)*. The Arthur H. Clark.
- BOYM, M. (1656). *Flora sinensis, fructus floresque humillime porrigens serenissimo et potentissimo Leopoldo Ignatio, Hungariae regi florentissimo, &c. Fructus saecul promittenti Augustissimos*. Typis M. Rictij. <https://www.biodiversitylibrary.org/bibliography/123322>
- BRÁSIO, A. (1971). *Monumenta Missionária Africana*. (1ª série, vol. 11). Agência Geral do Ultramar.
- BROCHADO, J. P. (1989). A expansão dos Tupi e da cerâmica da tradição policrômica amazônica. *Dédalo*, 27, 65-82. <https://leiaufsc.files.wordpress.com/2013/03/6-1-brochado-j-p-a-expansao-dos-tupi-e-da-cerc3a2mica-da-tradic3a7ao-policromica-amazonica.pdf>
- BROCHADO, J. P. (2002). Tupi. In P. N. Peregrine & M. Ember (Eds.), *Encyclopedia of Prehistory* (pp. 343-344). Springer.
- CALVILLO UNNA, T. (2019). *En torno al Galeón Manila-Acapulco*. El Colegio de San Luis.
- CALVO, T. and MACHUCA, P. (2016). *México y Filipinas. Culturas y memorias sobre el Pacífico*. El Colegio de Michoacán, Ateneo de Manila University.
- CANOVA, A. (1999). *Relazione del primo viaggio attorno el mondo*. Antenore.
- CÁRCER y DISDIER, M. (1995). *Apuntes para la historia de la transculturación indoespañola*. UNAM.

- CARLIER, J. D. (2006). Mapeamento genético do ananaseiro (*Ananas comosus* (L.) Merrill). [Doctoral thesis, Universidade do Algarve]. Repositório da Universidade do Algarve. <http://hdl.handle.net/10400.1/441>
- CARLIER, J. D., COPPENS D'EECKENBRUGGE, G., LEITÃO, J. M. (2007). Pineapple. In C. Kole (Ed.), *Genome Mapping and Molecular Breeding in Plants*. (Volume 4) (pp. 331-332). Springer-Verlag.
- CARVALHO, L. M., FERNANDES, F. M., ZABLE, S. (2009). The collection of Pineapple fibers -*Ananas comosus*(Bromeliaceae) - at the Harvard University Herbaria.*Harvard Papers in Botany*, 14(2), 105-109. <https://doi.org/10.3100/025.014.0202>
- CARVALHO, T. N. (2020). The natural frontiers of a global empire. *Humanities*, 9(3), 89, 1-21. <https://doi.org/10.3390/h9030089>
- CASAL, G. (1986). *Ma'i Panoramas of Philippine Primeval*. Central Bank of the Philippines & Ayala Museum.
- CASIÑO, E. S. (1981). Arts and Peoples of the Southern Philippines. In G. Casal & J. Regalado, *The People and Arts of the Philippines*. Museum of Cultural History, University of California.
- CASTELNAU-L'ESTOILE, C. (2000). *Les ouvriers d'une vigne sterile. Les jésuites et la conversion des indiens du Brésil*. CNCDP, Centre Culturel Calouste Gulbenkian.
- CAVALCANTE, P. B. (1988). *Frutas comestíveis da Amazônia*. Museu Paraense Emilio Goeldi.
- CAVAZZI DA MONTECÚCCOLO, G. A. (1687). *Istorica Descrizione de'tre regni Congo, Matamba ed Angola*. Giacomo Monti.
- CLEMENT, C. (1989). A centre of crop genetic diversity in western Amazonia. *BioScience*, 39(9), 624-631. <https://doi.org/10.2307/1311092>
- CLEMENT, C., CRISTO-ARAÚJO, M., COPPENS D'EECKENBRUGGE, G., PEREIRA, A. A., PICANÇO-RODRIGUES, D. (2010). Origin and domestication of native Amazonian crops. *Diversity*, 2(1), 72-106. <https://doi.org/10.3390/d2010072>
- COIMBRA, C. E. A., WELCH J. R. (2020). Pineapple among the indigenous Nambikwara: Early twentieth-century photographic documentation from Central Brazil. *Ethnobiology Letters*, 11(1), 67-75. <https://www.jstor.org/stable/26965303>
- COLLINS, J. L. (1960). *The pineapple*. Interscience Publishers Inc.

- COO, S. (2014). *Clothing and the colonial culture of appearances in nineteenth-century Spanish Philippines (1820-1896)*. [PhD Thesis, Université Nice Sophia Antipolis]. Hal thèses, theses en legne. <https://theses.hal.science/tel-01126974>
- COO, S. (2019). *Clothing the Colony: Nineteenth-century Philippine Sartorial Culture, 1820-1896*. Ateneo de Manila University Press.
- COPPENS D'EECKENBRUGGE, G., DUVAL, M. F. (2009). The Domestication of pineapple: context and hypothesis. Newsletter of the pineapple working group, International Society of Horticultural Science. *Pineapple News*, 16, 15-27.
- COPPENS D'EECKENBRUGGE, G., DUVAL, M. F., LEAL, F. (2018). The pineapple success story: from domestication to pantropical diffusion. In R. Ming (Ed.) *Genetics and genomics of pineapple* (pp. 1-25). Springer nature.
- CRONON, W. (1983). *Changes in the Land, Indians, colonists and the ecology of New England*. Hill and Wang.
- CROSBY, A. W. (1972). *The Columbian exchange. Biological and cultural consequences of 1492*. Greenwood Publishing Group.
- CROSSLEY, J. N. (2014). The Early History of the Boxer Codex. *Journal of the Royal Asiatic Society*, 24(1), 115-124. <https://doi.org/10.1017/S1356186313000552>
- CUNHA, A. G. (1978.) *Dicionário Histórico das Palavras Portuguesas de Origem Tupi*. Ed. Melhoramentos.
- CUNHA, M. C. (2012). *Índios do Brasil. História, Direitos e Cidadania*. Claroeniga.
- DANERI, J. J. (2005). Fernández de Oviedo's pineapple and cultural authority in imperial Spain. *Monographic Review/Revista Monográfica*, XXI, 26-39. https://www.academia.edu/6386091/Fernández_de_Oviedos_pineapple_and_cultural_authority_in_imperial_Spain
- DAVIS, M. (1991). Piña fabric of the Phillipines. *Arts of Asia*, 21(5), 125-129.
- DEBNATH, S. (2016). Pineapple Leaf Fibre-A Sustainable Luxury and Industrial Textiles. In M. Gardetti & S. Muthu (Eds.), *Handbook of Sustainable Luxury Textiles and Fashion. Environmental Footprints and Eco-design of Products and Processes* (pp. 35-49). Springer. https://doi.org/10.1007/978-981-287-742-0_3
- DEPARTMENT OF AGRICULTURE AND FISHERIES SEARCH. (2009). Chapter 01. The Pineapple. In *Pineapple best practice manual* (pp. 2-15). Queensland Government. https://www.daf.qld.gov.au/_data/assets/pdf_file/0007/66247/Ch1-The-Pineapple.pdf

- DUPORT, D. (2001). La variété botanique dans les récits de voyage au XVI^e siècle: une glorification du Créateur. *Revue d'Histoire Littéraire de la France*, 101(2), 195-212. <https://www.cairn.info/revue-d-histoire-litteraire-de-la-france-2001-2-page-195.htm>
- DUVAL, M. F., BUSO, G-S., FERREIRA, F. R., NOYER, J. L., COPPENS D'EECKENBRUGGE, G., HAMON, P., FERREIRA, M. E. (2003). Relationship in Ananas and other related genera using chloroplast DNA restriction site variation. *Genome*, 46(6), 990-1004.
- EHRMAN, E. (2018). *Fashioned from Nature*. Victoria and Albert Museum London.
- FERRÃO, J. E. M. (1993). *A aventura das plantas e os Descobrimentos Portugueses*. IICT, Fundação Berardo, Chaves Ferreira-Publicações.
- FERRÃO, J. E. M. (2015). *Le voyage des plantes & les grandes découvertes*. Chandeigne.
- FINDLEN, P. (1994). *Possessing Nature. Museums, Collecting, and Scientific culture in Early Modern Italy*. University of California.
- FINDLEN, P. (2004). *Athanasius Kircher. The last man who knew everything*. Routledge.
- FROMONT, C. (2022). *Images on a mission in Early Modern Kongo and Angola*. The Pennsylvania State University Press.
- GÂNDAVO, P. M. (1922). *Treatise of the land of Brazil*. In *The Histories of Brazil*. John Batterson Stetson (Ed.). Cortés Society, vol. II.
- GERBI, A. (1985). *Nature in the New World. From Christopher Columbus to Gonzalo Fernández de Oviedo*. University of Pittsburgh Press.
- GIL, J., VARELA, C. (1994). Michele da Cuneo. In J. Gil & C. Varela (Eds.), *Cartas de particulares a Colón y relaciones coetáneas* (pp. 235-260). Alianza Editorial.
- HALDE, J. B. (1736). *Description géographique, historique, chronologique, politique, et physique de l'empire de la Chine et de la Tartarie chinoise*. La Haye.
- HENRIQUES, I. C. (1989). Os portugueses e a reconstrução do mundo das plantas: o exemplo africano nos séculos XV e XVI. In Comissão Nacional para as Comemorações dos Descobrimentos Portugueses (Ed.), *Actas do Congresso Internacional Bartolomeu Dias e a sua época* (vol. III, pp. 367-368). Comissão Nacional para as Comemorações dos Descobrimentos Portugueses.
- HIKAL, W. M., MAHMOUD, A. A., SAID-AL AHL, H. A. H., BRATOVCIC, A., TKACHENKO, K. G., KAČÁNIOVÁ, M., RODRIGUEZ, R. M. (2021). Pineapple (*Ananas comosus* L. Merr.), Waste Streams, Characterisation and Valorisation: An Overview. *Open*

Journal of Ecology, 11(9), 610-634. <https://www.scirp.org/journal/paperinformation.aspx?paperid=111684>

- HOFMAN C. L., MENNO, L. P., HOOGLAND, A. B. & MARTIN, J. A. (2019). Colonial Encounters in the Southern Lesser Antilles: Indigenous Resistance, Material Transformations, and Diversity in an Ever-Globalizing World. In C. L. Hofman & F. W. M. Keehnen, *Material Encounters and Indigenous Transformations in the Early Colonial Americas: Archaeological Case Studies* (pp. 359-384). Brill.
- JAVALANA, R. B. (2017). *Weaving Cultures. The invention of Colonial Art and Culture in the Philippines, 1565-1850*. Ateneo de Manila University Press.
- JAWAID, M., ASIM, M., TAHIR, P., and NASIR, M. (2020). *Pineapple Leaf Fibers. Processing, Properties and Applications*. Springer.
- JOY, P. P., ANJANA, R. (2017). Pineapple. In K.V. Peter (Ed.), *Genesis and evolution of horticultural crops* (pp. 263-296). Kruger Brentt Publishers.
- LADERO QUESADA, M. A. (2008). La descripción del Nuevo Mundo en la primera mitad del siglo XVI: Pedro Mártir de Anglería y Gonzalo Fernández de Oviedo. *Catharum. Revista de Ciencias y Humanidades*, (9), 17-28.
- LAUFER, B. T. (1929). The American plant migration. *The Scientific Monthly*, 28(3), 239-251. <https://www.jstor.org/stable/14787>
- LEAL, F. and COPPENS d'EECKENBRUGGE, G. (1996). Pineapple. In J. Janick & J. N. Moore (Eds.), *Fruit breeding. I. Tree and tropical fruits* (pp. 515-557). Wileys and Sons.
- LEITE, S. (1945). *História da Companhia de Jesus no Brasil*. (Vol. 5). Instituto Nacional do Livro.
- LEITE, S. (1953). *Artes e Ofícios dos Jesuitas no Brasil (1549-1760)*. Edições Brotéria.
- LEITE, S. (1955). *Cartas do Brasil e mais escritos do P. Manuel da Nóbrega (Opera Omnia)*. Imprensa da Universidade de Coimbra.
- LESTRINGANT, F. (1981). Fictions et l'espace brésilien à la Renaissance: L'exemple de Guanabara. En: *Arts Et Légendes D'espaces. Figures Du Voyage Et Rhétoriques Du Monde*. Edited by C. Jacob and F. Lestringant (pp. 205-256). Presses de L'École Normale Supérieure.
- LESTRINGANT, F. and GOMEZ-GÉRAUD, M. C. (1999). *D'encre de Bréail: Jean de Léry, écrivain*. Paradigme.
- LEVITT, R. (2014). A Noble Present of Fruit: A Transatlantic History of Pineapple Cultivation. *Garden History*, 42(1), 106-119. <https://kclpure.kcl.ac.uk/portal/en/publications/a-noble-present-of-fruit-a-transatlantic-history-of-pineapple-cul>

- LIM, T. K. (2012). *Edible medicinal and non-medicinal plants: Fruits*. Springer.
- LIMA, D. (2014). *Saveurs et savoirs du monde. Circulations et appropriations de fruits tropicaux dans l'Empire portugais atlantique (v. 1550-v.1650)*. [Unpublished PhD thesis. Universidade Nova de Lisboa/Sorbonne].
- LISBOA, C. (1967 [1624-1627]). *História das plantas e animais do Maranhão*. AHU-CEHU.
- LOBO, M. G., PAULL, R. E. P. (2017). *Handbook of pineapple technology. Production, Postharvest, Science, Processing and Nutrition*. Blackwell.
- MACHUCA, P. (2014). The arrival of American plants in the Philippines: Ecological colonialism in the sixteenth-to-eighteenth centuries. *Anais de História de Além-Mar*, XV(2014), 231-260.
- MACHUCA, P. (2016a). La palma de coco: regalo de Filipinas a Mexico (siglos XVI-XVII). In T. Calvo & P. Machuca (Eds.), *México y Filipinas: culturas y memorias sobre el Pacífico* (pp. 321-340). El Colegio de Michoacán.
- MACHUCA, P. (2016b). Tras las huellas del mestizaje cultural entre México y Filipinas. In T. Calvo & P. Machuca (Eds.), *México y Filipinas: culturas y memorias sobre el Pacífico* (pp. 385-402). El Colegio de Michoacán, El Ateneo de Manila University Press.
- MANCALL, P. C. (2020). *Nature and Culture in the Early Modern Atlantic*. University of Pennsylvania Press.
- MARRACHE-GOURAND, M. (2008). Enjeux idéologiques du discours sur le plantes dans le récit de voyage. Exemples de la banana et de l'ananas. In M. C. Pioffet (Ed.), *Écrire des récits de voyage (XVe-XVIIIe siècles). Esquisse d'une poétique en gestation* (pp. 203-217). PUL.
- MARTYR d'ANGLERIA, P. (1912 [1516]). *The Eight Decades of Peter Martyr D'Angheria*. Putman.
- MARTYR d'ANGLERIA, P. (1989 [1516]). *Décadas del Nuevo Mundo. Crónicas y Memorias*. Ediciones Polifeno.
- MARZAL, M. M., TUA, S. N. (1999). *Un reino en la frontera: las misiones jesuitas en la América colonial*. Fondo Editorial Pontificia Universidad Católica del Perú.
- MÉTRAUX, A. (1928). *La civilization matérielle des tribus Tupi-Guarani*. Librairie Orientaliste Paul Geuthner.
- MILGRAM, B. L. (2005). Piña cloth, identity and the project of Philippine nationalism. *Asian Studies Review*, 29(3), 223-246. <https://doi.org/10.1080/10357820500270144>
- MONARDES, N. (1574). *Primera, segunda y tercera partes de la historia medicinal de las cosas que se traen de nuestras Indias Occidentales, que sirven en medicina*. Alonso Escrivano.

- MONTINOLA, L. (1991). *Piña*. Amon Foundation.
- MONUMENTA BRASILIAE (1956-1958). S. Leite (Ed.). Monumenta Historia Sicitatis Jesu.
- MYERS, K. A. (1993). A representation of New World phenomena. Visual epistemology and Gonzalo Fernández de Oviedo's illustrations. In J. Williams & R. Lewis (Eds.), *Early Images of the Americas. Transfer and Invention* (pp. 183-213). University of the Arizona Press.
- O'CONNOR, K. (2013). *Pineapple, a global history*. Reaktion Books.
- OKIHIRO, G. Y. (2009). *Pineapple culture: a history of the tropical and temperate zones*. University of California Press.
- OLIVEROS, J. M. (2015). *Os doces frutos da colônia: flora, conservas e compotas na América portuguesa quinhentista*. [Master's Thesis. Universidade Estadual de Maringá, Programa de Pós-Graduação em História].
- OLVEDA, J. (2017). *Relaciones intercoloniales. Nueva España y Filipinas*. El Colegio de Jalisco.
- O'MALLEY, J., BAILEY, G., HARRIS, S., KENNEDY, T. (Eds.). (2006). *The Jesuits II: cultures, sciences, and the arts, 1540-1773*. University of Toronto Press.
- OVIEDO Y VALDEZ, G. (2007 [1535]). Appendices. C. Translations of passages from Fernández de Oviedo's *Historia general y natural de las Indias*. In K. Myers & N. Scott (Eds.), *Fernández de Oviedo's Chronicle of America: A new History for a New World* (pp. 143-179). University of Texas Press.
- PARDO TOMAS, J. (2000). Le immagini del piante americane nell'opera di Gonzalo Fernández de Oviedo (1478-1557). In G. Olmi, L. Tomasi & A. Zanca (Eds.), *Natura-Cultura: L'interpretazione Del Mondo Físico Nei Testi e Immagini* (pp. 163-188). Leo Olschki.
- PARDO TOMÁS, J. (2002). *Oviedo, Monardes, Hernández: El tesoro natural de América: Colonialismo y ciencia en el siglo XVI*. Nivola Libros Editores.
- PATIÑO, V. M. (1992). An ethnobotanical sketch of the palm *Bactis (Guilielma) gasipaes*. *Principes*, 36(3), 143-147. <https://palms.org/wp-content/uploads/2016/05/vol36n3p143-147.pdf>
- PHIPPS, E. (2020). Silk, cotton, wild banana and piña: luxury cloths and their material - connecting worlds. In F. H. Capristano-Baker & Meha Priyadarshini (Eds.), *Transpacific Engagements. Trade, translation and visual culture of entangled empires (1565-1898)* (pp. 181-196). Ayala Foundation Inc, Getty Research Institute, Kunshistorisches Institute.

- PIPERNO, D. R. (2011). The Origins of Plant Cultivation and Domestication in the New World Tropics Patterns, Process, and New Developments. *Current Anthropology*, 52(4), 453-470. <https://doi.org/10.1086/659998>
- PORRAS, J. L. (1990). *The Synod of Manila of 1582*. (Part 1, vol. 4). Historical Conservation Society.
- QUINLAN, B. (2011). Ethnomedicine. In M. Singer & P. Erikson (Eds.), *A companion to medical anthropology* (pp. 381-403). Blackwell Publishing Limited.
- RABASA, J. (1993). *Inventing America. Spanish Historiography and the Formation of Eurocentrism*. University of Oklahoma.
- RIBEIRO, O. (1962). *Aspectos e problemas da expansão portuguesa*. Junta de Investigações do Ultramar.
- RODRIGUEZ MARTÍNEZ, M. C., ORTIZ CEBALLOS, P., COE, M. D., DIEHL, R. A., HOUSTON, S. D., TAUBE, K. A., DELGADO CALDERÓN, A. (2006). Oldest writing in the New World. *Science*, 313(5793), 1610-1614. <https://www.science.org/doi/10.1126/science.1131492>
- ROSÁRIO, A. (1702). *Frutas dos Brasil, numa nova e ascetica monarquia consagrada à Santíssima Senhora do Rosário*. António Pedroso Galvão.
- RUIZ GUTIERREZ, A. (2012). *El Galéon de Manila (1565-1815); Intercambios culturales*. Ed. Alhulia.
- SALES COLIN, O. (2000). *El movimiento portuario de Acapulco. El protagonismo de Nueva España en la relación con Filipinas, 1587-1648*. Plaza y Valdés.
- SAUNDERS, N. J. (2005). *The Peoples of the Caribbean: An Encyclopedia of Archaeology and Traditional Culture*. ABC- Clio.
- SCOTT, W. H. (1968). *Prehispanic Source Material for the Study of Philippine History*. University of Santo Tomas.
- SEMEDO, A. (1994[1642]). *Relação da grande monarquia da China*. DSEJ/FM.
- SHANER, L. (Ed.). (1999). *The The Jahangirnama, Memoirs of Jahangir. Emperor of India*. Oxford University Press.
- SKIDMORE, J. (2006). *The Cascajal Block: the earliest Precolumbian writing*. Mesoweb Reports. <http://www.mesoweb.com/reports/Cascajal.pdf>

- SMITH, C. E. (1968). The New World Centers of Origin of Cultivated Plants and the Archaeological Evidence. *Economic Botany*, 22(3), 253-266. <https://www.jstor.org/stable/4252962>
- SOARES DE SOUSA, G. (1989 [1587]). *Notícias do Brasil*. Edições ALFA.
- TAYLOR, D. (1938). The Caribs of Dominica. *Anthropological Papers*, (3), 109-196.
- THEVET, A. (1557). *Les Singularitez de la France Antartique*. Chez Maurice de la Porte.
- THEVET, A. (1568). *The New Found World, or Antarctic*. Thomas Hackett.
- TOSCANO, S. (1946). Una empresa renacentista de España: la introducción de cultivos y animales domésticos euroasiáticos en México. *Cuadernos Americanos*, XXV, 143-157.
- TURNER, D. (1985). Forgotten treasures from the Indies: The illustrations and drawings of Fernández de Oviedo. *Huntington Library Quarterly*, 48(1), 1-46. <https://www.jstor.org/stable/3817095>
- VELENZUELA, A. (2014). East Asian Stills. Distillation influences in Mezcal (Agave spirits) production in Mexico. In A. Schottenhammer (Ed.), *Tribute, Trade and Smuggling, Commercial, Scientific and Human Interaction in the Middle Period and Early Modern World* (pp. 141-154). Hattassowitz Verlag.
- WARSH, M. A. (2018). *American Baroque: Pearls and the nature of the Empire:1492-1700*. University of North Carolina Press.
- YUSTE, C., PIZON, G. (2016). *A 500 años del hallazgo del Pacífico. La presencia novohispana en el Mar del Sur*. Universidad Nacional Autónoma de México.

Notas

1 In this essay, to update the scientific nomenclature, I consulted the website of the Global Biodiversity Information Facility <http://www.gbif.org>

2 Interestingly, this 16th century solution for transporting the fruit seems to have been the first step in a long industrialization process. Currently, the pineapple canning industry absorbs most of the world's production of this fruit.

3 Due to the fruit of *A. comosus*' resemblance to the pine cones of *Pinus pinaster* Aiton, Oviedo, the chronicler who first described this American fruit, named the pineapple "piña". He wrote: "The Christians [initially] named it "pinecone" because it somewhat resembles one, but these [fruits] are handsomer and do not have the rustic nature of the pinecones of the Castilian piñón" ([Oviedo, 2007, p. 161](#)). The term "piña" is also used to refer to a handwoven Philippine

textile produced with pineapple fibres, mainly in the province of Aklan, in Western Visayas. We will return to this point later.

4 In this context, we can consider the concept of “domestication” as corresponding to a form of “co-evolution”, through which human populations, plants and animals evolve together and depend on each other. See: [Coppens d’Eeckenbrugge & Duval, 2009, pp.15-27](#).

5 On this topic, see [Clement, 1989, pp. 624-631](#); [Patiño, 1992, pp. 143-147](#).

6 Other American species, like tomatoes (*Solanum lycopersicum* L.), peanuts (*Arachis hypogea* L.), squashes or pumpkins (*Cucurbita* L.) circulated and were gradually introduced into the diet of the European settlers. On the circulation of American species, see [Laufer, 1929, pp. 239-245](#); [Crosby 1972](#); [Ferrão, 2005, pp. 60-175](#); [Piperno, 2011](#).

7 For a better understanding of the evolution and diffusion of this species, see [Cavalcante, 1988, pp. 35-36](#); [Leal & Coppens d’Eeckenbrugge, 1996](#); [Duval et al., 2003](#); [Carlier, 2006](#); [Carlier et al., 2007, pp. 331-332](#); [Okihiro, 2009](#); [Clement et al., 2010](#); [Joy & Anjana, 2017](#); or [Coppens d’Eeckenbrugge et al., 2018](#). Also see [Department of Agriculture and Fisheries Search \(2009\)](#) and GBIF Secretary (2022) on pineapple, or GBIF Secretary (2022) on curaná.

8 At the time of first contact between Europe and the Caribbean, the indigenous peoples were probably: the Taíno (Antilles and Bahamas), the Kalinago (Lesser Antilles) the Ciguayo and Macorix (Hispaniola) and the Guanahatabey (western Cuba). For more on these populations, see [Taylor, 1938, pp. 112-196](#) or [Saunders, 2005, pp. 43-47](#). In the coastal areas of the modern-day Brazil, the Europeans mainly encountered speakers of the Tupi-Guarani language. On the impacts of the colonial encounters on the culture and societies, see, amongst others: [B. Quinlan, 2011, pp. 381-403](#); [Hofman et al., 2019, pp. 359-384](#); or [Mancall, 2020](#).

9 Pigafetta was the first European to report on the use of the pineapple on the Brazilian coast. He also reported on the textile production in the Philippines. On Pigafetta, see [Canova \(1999\)](#) and [Alessandrini \(2019, pp. 61-80\)](#).

10 Some authors verified the presence of pineapple plant remains in the *Coxcatlan Cave*. This fact suggests the consumption of pineapple in Central America in the region of the Tehuacán valley in very ancient times (c. 5000-3400 BC). See [Smith, 1968, pp. 253-266](#). More recently, researchers identified the image of a pineapple on the *Cascajal Block*, a stone associated with the Olmec civilization. Like other plant species (such as tobacco, cacao, or cashew) it seems that pineapple plants circulated and were brought to Mexico in ancient times. See [Coppens d’Eeckenbrugge et al., 2011, pp. 47-48](#); [Rodríguez-Martínez et al., 2006, pp. 1610-1614](#); or [Skidmore, 2006](#).

11 On Michele da Cuneo, see [Gerbi, 1985, pp. 31-35](#); [Airaldi and Formisano, 1996](#).

12 The letter is held at Bologna University Library [Cod 4075, 24r-46r]. For a modern edition of the letter, see [Gil and Varela \(1994\)](#).

13 “There are also plants that resemble artichoke plants [...]. Their fruit is excellent and can be cut with a knife like a turnip and it seems to be wholesome” (Translated by the author from [Gil and Varela, 1994](#)).

14 In *De Orbe Nuovo* ([Martyr de Angleria \(1989 \[1516\]\)](#)), he described the natural resources of the Americas and the first interactions between the Columbine fleet and the Taíno peoples. On Peter Martyr d’Angleria, see [Gerbi, 1985, pp. 50-75](#); [Martyr de Angleria, 1989 \[1516\]](#); [Ladero Quesada, 2008, pp. 17-28](#).

15 In this topic, of the extraordinary sensory attributes of the pineapple, it is interesting to consider the reflections of [Lima, 2014](#) or [Baumhammer and Kennedy, 2017, pp. 190-222](#).

16 On Oviedo, see [Gerbi, 1985, pp. 124-377](#) or [Ladero Quesada, 2008](#).

17 On Oviedo’s pineapple, see [Turner, 1985, pp. 1-46](#); [Myers, 1993, pp. 182-213](#); [Rabasa, 1993, pp. 137-151](#); [Bénat-Tachot, 1997, pp. 193-230](#); [Daneri, 2005, pp. 26-39](#); [Pardo Tomás, 2000, pp. 163-188](#); [Oviedo, 2007 \[1535\], pp. 159-163](#).

18 “I have also seen it in the city of Avila, as I related in the first chapter of this seventh book; in many parts of Andalusia corn has been grown, and therefore I am of the opinion that these pineapples or thistles could grow, bearing the shoots I described, were they harvested after three or four months here [in America]” ([Oviedo, 2007 \[1535\], p. 163](#)).

19 Like the American fruit, several plants, animals & minerals of the East and West Indies were rare and expensive in Europe. From the sixteenth century onwards, the Europeans sought to capture the exotic nature of the Indies and other extra European regions in libraries, menageries, gardens, and artistic objects. See, amongst others: [Findlen \(1994\)](#) or [Avery et al. \(2015\)](#). On European pineapple production, see: [Levitt \(2014, pp. 106-119\)](#).

20 The French contingent was well received by the *Tupinambá*, who joined forces with them in the fight against the Portuguese. Villegagnon erected a fortress on the island of Seriguipé, from which he controlled the movement of vessels in Guanabara Bay. The French presence in the region was, however, brief as the Gallic troops were expelled by the Portuguese who had already settled there.

21 Upon disembarking in this Brazilian region, the French came across the *Tupinambá*, a group of indigenous peoples who spoke archaic Tupi and dominated a large part of the coastline. On the traditions of these peoples, see: [Brochado \(2002\)](#); [Cunha \(2012, pp. 26-53\)](#).

22 Regarding André Thevet’s descriptions of plants, see: [Duport \(2001, pp. 195-212\)](#); [Marrache-Gouraud \(2008, pp. 203-217\)](#).

23 Over time, many authors have devoted themselves to analysing the qualities and effects of products extracted from pineapples. Recent studies continue to highlight the therapeutic and curative qualities of *A. comosus* extracts. See: [Lim \(2012, pp. 593- 615\)](#) or [Hikal et al. \(2021\)](#). In

this later work we became aware of the immense qualities of extracts from the fruit: “Pineapple residues are rich in many bioactive compounds such as ferulic acid, vitamin A and C as antioxidant, and containing alkaloids, flavonoids, saponins, tannins, cardiac glycoside, steroids, triterpenoids and phytosterols may provide a good source of several beneficial properties, as well as bromelain that showed significant anticancer activity” ([Hikal et. al., 2021, pp. 610-634](#)).

24 Like Thevet, Jean de Léry indicates the importance of the Brazilian pineapple in local culture. On Léry’s work, see [Lestringant, 1981, pp. 205-56](#) or [Lestringant and Gomez-Géraud, 1999](#).

25 To understand the importance the Society of Jesus gave to this data collection, see: [O’Malley et al. \(2006\)](#) or [Anagnostou \(2007, pp. 293-312\)](#).

26 We refer, for example, to *Nuovi avisi* (1562).

27 Father Henriques was then Attorney General of the Province of Portugal and the Overseas Provinces: India, Ethiopia, and Brazil.

28 “O mestre leva estas conservas pera os enfermos scilicet, os ananazes pera dor de pedra, os quais posto que não tenham tanta virtude como verdes, todavia fazem proveito. Os Irmãos, que lá houvessem desta enfermidade, deviam vir para cá, porque se achariam cá bem, como se tem por experiência. Vão também marmeladas de ibás, camucis e arasazes e para as câmaras um pouco de abóbora”. The reference to the term “ananazes” seems to come from Nóbrega’s letter (12.6.1561). Due to the lack of an English version of Nóbrega’s letter, this is the author’s translation.

29 “Habla [Manuel da Nóbrega] de ciertas conservas para los que tienen dolor de piedra, y las llama de Ananazes, [...], y quando se offreciese oportunidad de embiar algo desto por estas partes para ver si aprovecha, hariamos la prueba de buena voluntad”. Due to the lack of an English version of Polanco’s letter, this is the author’s translation.

30 On the use of these conserves by the Jesuits, see: [Lima \(2014\)](#); [Oliveros \(2015\)](#).

31 Like Gândavo, Oviedo also refers to the cultivation of pineapples: “In some places this kind and others grow wild, seeding themselves in the soil in great numbers. But without comparison those which are tilled and cultivated are the best and most delicate, fully acknowledging the care of the grower” ([Oviedo, 2007 \[1535\], p. 163](#)). So far it has not been possible to gather data providing evidence of the changes caused to the landscape by the massive cultivation of this species; there is also a lack of evidence attesting to the native populations’ involvement in the production of pineapple and fruit conserves. In the future, it will be necessary to find new data to support this analysis. On this topic, see: [Cronon \(1983\)](#). For a study of indigenous peoples’ involvement in the exploitation of other natural resources in the colonial world, see, for example: [Warsh \(2018\)](#).

32 The Europeans who disembarked on the coast of present-day Brazil encountered two large population groups: to the south, the Guarani, who occupied a region located in the current state of São Paulo; and the Tupi, who lived along the coast between Iguape and Ceará. This Tupi-Guarani continuity was only broken in certain areas along the coast, where other indigenous peoples were to be found. As the religious missions progressed, many of the traditions of these peoples were lost. In fact, in the villages, the creation of a common language, besides facilitating the missionary work, contributed to the abandonment of native languages and to the erasure of the memories and traditions of each people. The subject of the creation of these settlements is complex and therefore beyond the scope of this essay. For a deeper understanding of the topic, see: [Leite \(1945\)](#); [Marzal & Tua \(1999\)](#); [Castelneau-L'Estoile \(2000\)](#); [O'Malley et al. \(2006\)](#).

33 Fermenting the fruit's juice in the air resulted in a drink with a high alcohol content. This drink was mentioned by voyagers, chroniclers and missionaries who passed through the New World and Brazil and was mostly consumed by the local population. On the production and consumption of this pineapple "wine", see the reports from Brazil by Jean de Léry, André Thevet, Pero Magalhães, Gândavo, and Gabriel Soares de Sousa; and from the New World, by Oviedo and José de Acosta. See also [Coimbra and Welch \(2020\)](#).

34 Also known as *Notícias do Brasil* or *Descrição verdadeira de todo o Estado pertencente à Coroa de Portugal, da fertilidade dessa província, de toda as aves, animais, peixes, bichos, plantas, que nelas há, e dos costumes dos seus naturais*.

35 "A natureza deste fruto é quente e húmido e muito danoso para quem tem ferida ou chaga aberta, os quais ananases, sendo verdes, são proveitosos para curar chagas com eles, cujo sumo come toda a carne podre, do que se aproveita o gentio [...] quando são maduros os índios fazem vinho com que se embebedam, para que os colhem mal maduros para ser mais azedo do que vinho; [...] desta fruta se faz muita conserva, aparados da casca, a qual é muito formosa e saborosa...". Due to the lack of an English version of Sousa's text, this is the author's translation.

36 Humoral Theory of Galen (Sec. I AD). The humoral theory continued to be the basis of sixteenth-century medicine. It presupposed the existence in the human body of four humours (blood, phlegm, yellow bile, and black bile), originating respectively from the heart, brain, liver, and spleen. Each humour was characterised by pairs of qualities (cold/hot; dry/wet). For everyone, the correct balance of humours would be the secret to good health. Disease was caused by an imbalance in these humours. Diet, bloodletting, enemas or vomitives formulated with plant, mineral or animal products caused the expulsion of an excess of a certain humour and restored good health.

37 It should be remembered that the shipping of these preserves would have required both vast amounts of sugar and the large-scale production of ceramic containers. No evidence of these glazed containers has been found so far, but it is an area requiring further study. It is possible that their production was organised by the Jesuits in indigenous villages or at the

Jesuit *colégios* ([Leite, 1953, pp. 64-68](#)). On Tupi artifact traditions, see: [Métraux \(1928\)](#), or [Brochado \(1989\)](#).

38 The volume, known as the *Drake Manuscript* and entitled *Histoire Naturelle des Indes* when it was bound in the eighteenth century, gives us a wonderful picture of daily life at the time of Francis Drake's visits to the region. In fl. 4r we read: "Pinnes: An exquisite fruit, extremely good, having the taste of raspberry; it grows on a tall tree where there can be found several, having the characteristic of growing rather down than up in contrast to the fruits of France. It is eaten raw with salt only to relieve the Indians of stomach pains". <https://www.themorgan.org/collection/Histoire-Naturelle-des-Indes/4>

39 Here we can read: "[pineapple] it is good for them that are troubled with the stone, and it is very prejudicial for fevers" (text modernised by the author) (Purchas, 1625). The report is attributed to a Jesuit missionary that worked in the Brazilian mission.

40 Cristóvão de Lisboa refers to "wild" varieties, probably different from the cultivated varieties previously observed on Brazil's Atlantic coast.

41 On this property, see *Flora das Filipinas*: "Se asegura que los que comen de esta fruta con exceso, à veces escupen sangre. [...] Por tanto tal vez aconseja Linneo que se prohíba á las mugeres embarazadas" (Blanco, 1845, p. 162).

42 Pineapples and other "fruits of the land" began to be cultivated in the gardens and farms attached to the Jesuit colleges of the mission in Brazil (along with the schools in Pernambuco and Rio de Janeiro and, most importantly, Quinta do Tanque, in Bahia) and in Angola (next to the Colégio de São Paulo, in Luanda, Quinta do Bengo). This allowed fruit to be produced for refreshment and for making preserves and remedies. These products would have been intended for missionaries and local converts. For more on these gardens, see: [Lima \(2014, pp. 127-144\)](#); [Leite \(1945, p. 161\)](#) and [Brásio \(1971, pp. 467-469\)](#). For a textual source on Angola's pineapples, see the work of the capuchin friar [Cavazzi da Montecúccolo \(1687\)](#). For a recent study on the cross-cultural interactions between Congolese people and the capuchin missionaries, see: [Fromont \(2022\)](#).

43 The Atlantic islands - mainly São Tomé and Cape Verde - were used as centres of agricultural experimentation. The cultivation of European and tropical fruit trees and vegetables was tested out, so that it would be possible to resupply fleets that disembarked or made water stops there. These connected imperial territories, allowing new plant species to be produced, foodstuffs to be disseminated and contributed to the success of transoceanic voyages. For more on the role of these Atlantic islands, see: [Ribeiro \(1962, pp. 52-55\)](#); [Henriques \(1989, pp. 367-368\)](#); [Ferrão \(1993, p. 36\)](#).

44 Although even today there is no agreement on when the Portuguese first landed in Santa Helena, from 1502 it became a fundamental link in ocean crossings as the last stopover on the journey between the East Indies and Lisbon. [Collins \(1960\)](#) mentions that the introduction of pineapples on this island took place in 1505. It seems unlikely that the Portuguese ships that

landed there in 1505 would have brought a pineapple plant with them (from Brazil). It should be noted that Santa Helena was a crossing point for the Carreira ships, on the way back to the Kingdom (the route leading from Goa to Lisbon). As I showed the *A. comosus* was introduced in Goa in the 1560's ([Carvalho, 2020](#)).

45 Jahangir had a huge pineapple crop in Angra. This fact was reported in the emperor's memoirs, where it reads: "many thousands [of pineapples] are produced every year in the Gulafshan Garden in Agra" ([Shaner, 1999, p. 24](#)).

46 Although it is beyond the scope of this analysis, it is important to recognise the contribution made by churchmen in the sixteenth and seventeenth centuries to the narrative constructed about the nature of the New World. Regarding the pineapple, the work of Friar António do Rosário in the 1600s deserves a mention. In his volume *Frutas do Brazil* [Fruits of Brazil] he offers a mystical interpretation of some Brazilian fruits by way of parables. By so doing, he associates the fruits with symbology and Catholic worship. He dedicates the First Parable to the "Ananás, Rei dos pomos" [Pineapple, king of pomes]. He believed that the morphology and extraordinary qualities and attributes of this fruit should be seen as a symbol of divine royalty and a "metaphor for the Rosary" ([Rosário, 1702, pp. 1-45](#)).

47 Several physicians and voyagers reported on the presence of the pineapple in the East Indies. Such was the case of the texts by Cristóvão da Costa, *Tractado de las Drogas* (Burgos, 1578); Jan Huygens van Linschoten, *Itinerario* (Amsterdam, 1596); Manuel Godinho de Erédia, *Suma das Plantas e Árvores da Índia Intra Ganges* (Goa, 1614); François Pyrard de Laval, *Voyage* (Paris, 1619); or the notes that Filipo Sassetti sent to Europe.

48 On the intercontinental transfer of plants and animals by the Spanish, see: [Toscano, \(1946, pp. 143-157\)](#); [Machuca \(2014, pp. 231- 260\)](#) or [Machuca \(2016a, pp. 321-340\)](#).

49 Monardes (1493-1588) was a Sevillian physician. In addition to practising medicine and caring for his large botanical garden, he devoted himself to the intercontinental trade in natural products and the study of New World *materia medica*. He was the author of medical-botanical works, among which the *Historia Medicinal* stands out. This was published in 3 parts and went under the complete name of *Historia Medicinal de las cosas que se traen de nuestras Indias Occidentales* (Seville, 1565, 1569, 1571). Later, in 1574, he published these books in one volume which was widely disseminated. On Monardes, see: [Pardo Tomás \(2002\)](#).

50 "Tienen la [piña] por buena para el estomago, y por confortativa del coracon, y restituye el apetito perdido: es fruta general en todas las partes de las Indias, y estimada en mucho en ellas, comese al principio de la comida, por fruta de principio, y usan della en las siestas calientes, porque dizen que refrescan y son frias..." ([Monardes, 1574, pp. 82-83](#)).

51 D. Domingos de Salazar was the Bishop of Manila. He arrived in Manila in 1581 and found the Catholic Mission very disorganised. In order to establish the norms for the governance of his new diocese, he called a synod in 1582. It was the first Synod held in the Philippines.

52 “Letter from Salazar to Felipe II”, cited in [Blair, 1903, pp. 34-35](#).

53 Likely from the 1570s onwards. In fact, *A. comosus* had been taken from Brazil to Goa and Cochin in the early 1560s. Only after the species had been domesticated in India it was possible to transfer it to other Eastern lands.

54 Pineapples from the Province of Cantao received high praise from Father Alvaro Semedo ([Semedo, 1994\[1642\], p. 29](#)). Later, Jean Baptiste du Halde refers with great familiarity to the production of pineapples and other fruits in the provinces of *Yun-nan*, *Qang Tong* and *Formosa* ([1736, tome I, p. 32, 178, 230](#)). Regarding textile production, Halde refers to the use of silk, hemp and of *grasses*. Although he does not identify the latter, he mentions they could be used to weave a fabric that was lighter and cooler than silk. Might he have been referring to pineapple fibres?

55 A probable reference to the regular connections between Manila and Acapulco. It should be remembered that in Kirsher’s time, “Peru” was used to describe a vast South American region that today comprises the territories of Colombia, Ecuador, and Peru.

56 Some of Kircher publications deserve a mention: *Specula Melitensis Encyclica sive syntagma novum instrumentorum physico-mathematicorum* (1638), *Magnes sive de arte magnetica* (1640), *Ars magna lucis et umbræ* (1644), *Musurgia universalis sive ars consoni et dissoni* (1650), *Itinerarium extaticum s. opificium coeleste* (1656), *Iter extaticum secundum, mundi subterranei prodromus* (1657), *Scrutinium physico-medicum contagiosæ luis, quæ pestis dicitur* (1658) or *Mundus Subterraneus* (1678). For more on Kircher, see, amongst others, [Findlen \(2004\)](#).

57 Archaeological evidence attests to an interexchange between China and the Philippines long before the arrival of the Europeans. In addition to ceramics, silks and lacquers, Filipinos imported ivory, pearls, and spices. Cotton from the archipelago was a much sought-after commodity for the Chinese who brought silk and other textiles produced in China. The widespread use of Chinese products led to artisans abandoning their own handicrafts at the end of the sixteenth century and incorporating other Chinese raw materials and practices. This led the Spanish rulers to ban the use of Chinese textiles in 1591 and impose the production of their own clothing from local resources ([Montinola, 1991, pp. 114-138](#)).

58 “...La ysla [Panay] mas fertil y abundante de todas las descubiertas sacado la ysla de luçon porques muy fertil y abundante y de aRoz y puercos y gallinas çera y miel, y gran cantidad de algodon y medriñaque [...] es tierra sana y de buenos mantenimientos...” (Loarca, 1582). *Relation de las Yslas Filipinas*, <https://www.gutenberg.org/files/16501/16501-h/16501-h.htm#doe420>.

59 On the ancestral use of natural fibres in the Philippines, see: [Scott \(1968\)](#); [Casiño \(1981\)](#) or [Casal \(1986\)](#).

60 In 1571, a compulsory tribute payable to the King was imposed and thereafter regulated by Governor Legazpi. This measure aimed to maintain the financial strength of the colony, as

well as to dominate its population. The tax could be paid in metal, agricultural produce, or manufactured products, like cotton, abaca, or “new” fabrics. Could this new tribute have encouraged the production of *piña* textiles? See: [Montinola \(1991, pp. 5-25\)](#).

61 For more on Plasencia, see: Jose A. Fernández, “Juan de Plasencia OFM - Tatay ng Taytay ni Juan”.

62 On the reciprocal influences between the Philippines and the New World, see: [Bernal \(2012\)](#); [Velenzuela \(2014\)](#); [Yuste & Pizon \(2016\)](#); [Calvo y Machuca \(2016\)](#) or [Olveda \(2017\)](#).

63 For more on the cultural and human transfer brought about by the Manila Galleon, see: [Ruiz Gutierrez \(2012, pp. 32-37\)](#); [Calvillo Unna \(2019\)](#); [Sales Colin \(2000\)](#).

64 “The religious missionaries should establish primary schools where the natives can learn not only the Christian doctrine, reading and writing, but other trades thus making them good persons and useful citizens” ([Porrás, 1990, p. 41](#)).

65 “Letter from D. Domingo de Salazar to Filipe II (1590)” cited in [Blair, 1903, p. 226](#).

66 Referred to by travellers as “men of marvellous capacity, in devising and making all manner of things, especially in all *handie* crafts...” “Expedition of Thomas Candish” B/R, 15, p. 295.

67 “Piña-jusi” is the name given to a mixed fibre, consisting of pineapple fibre and silk [*Hu Shih*].

68 As [Javalana \(2017\)](#) mentions, the contact between different peoples resulted in reciprocal influences and promoted the interconnections between diverse knowledge and traditions.

69 In addition to these garments, shirts for men (*baro*) or women (*camisa* or *baro*), household linen and liturgical cloths were woven. For more on Filipino clothing, and the various Malay, Hindu, Chinese, Arab and European influences, see: Boxer (1950); [Montinola \(1991, pp. 68-94\)](#); [Crossley \(2014\)](#), [Coo \(2014\)](#), or Philippine Folklife Museum Foundation (2022). https://philippinefolkliifemuseum.org/portfolio_category/evolution-of-philippine-costume/ (consulted on 26/05/2022)

70 On the symbolism and use of clothing made with these fibres, see amongst others: [Davis \(1991, pp. 125-129\)](#); [Milgram \(2005\), pp. 223-246](#); [Carvalho et al. \(2009, pp. 105-109\)](#); [Ehrman \(2018, pp. 175-180\)](#); and [Coo \(2019\)](#).

71 For more on these projects, see Nanyang Academy of Fine Arts (2023) & Philippine Center Management Board (2018). <https://www.nafa.edu.sg/showcase/exhibitions/profile/pina-seda-pineapple-and-silk-cloths-from-the-tropics> e <https://philippinecenterny.com/pina-seda-pineapple-and-silk-clothes-from-the-tropics/> Consulted in October, 2022.

72 See, amongst others: [Jawaid, Asim, Tahir, and Nasir, 2020](#).

73 On the quality and promising use of pineapple fibres, see: [Debnath \(2016\)](#), [Lobo and Paull \(2017\)](#) or [Jawaid, Asim, Tahir, and Nasir, 2020](#).

74 Costa Rica, the Philippines, Brazil, Indonesia, and China were, in 2019, the five biggest pineapple producers ([Hikal et al., 2021, p. 615](#)).

75 Although the use of pineapple fibres is also common on the west coast of Africa and in India and China, its economic importance is not as pronounced as it is in the Philippines.