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An indigo blue: exploration and trade of Amazonian indigo in Portuguese America during the 18th century

Um azul cor de anil: exploração e comércio do anil amazônico na América portuguesa durante o século XVIII

Nathália Moro
Christian Fausto Moraes dos Santos
Universidade Estadual de Maringá
Maringá-Brasil

Abstract
The importance of indigo, a dyeing spice, in 18th-century Portuguese America stands out as a crucial element in colonization. Despite boosting agriculture, its farming activities were short-lived and did not achieve the same success as other commodities. Nevertheless, the cultivation of indigo provides valuable insights into Portuguese colonization, addressing themes such as the working conditions of indigenous people, the economic diversification of the colony, and innovations tested in indigo factories. The analysis of these activities also prompts reflection on the historical approach to plant species, emphasizing the need to study not only dominant genres like sugarcane and coffee but also plants and trades of lesser prominence. Understanding the reasons for economic failure is as crucial as analyzing triumphs in other sectors.
Keywords: Indigo; Hinterland drugs; Portuguese America.

Resumo
A importância do anil, uma especiaria tintória, na América portuguesa do século XVIII destaca-se como um elemento crucial na colonização. Apesar de ter impulsionado a agricultura, suas atividades agrícolas foram efêmeras e não alcançaram o mesmo êxito de outras *commodities*. No entanto, o cultivo do anil proporciona *insights* valiosos sobre a colonização portuguesa, abordando temas como as condições de trabalho dos indígenas, a diversificação econômica da colônia e as inovações testadas nas fábricas de anil. A análise dessas atividades também incita uma reflexão sobre a abordagem histórica em relação às espécies vegetais, destacando a necessidade de estudar não apenas os gêneros dominantes, como cana-de-açúcar e café, mas também plantas e comércios de menor destaque. Compreender os motivos do insucesso econômico é tão crucial quanto analisar os triunfos em outros setores.
Palavras-chave: Anil; Drogas do sertão; América portuguesa.

Introduction

Thinking about mercantilism between the 16th and 18th centuries without analyzing the role of dyeing extracts is impossible. Although they had already been included in the European search for spices in general, the coloring products gained greater prominence at the end of the 17th century when the Old World became more effectively interested in textiles. From then on, products such as indigo[1] began to occupy important spaces that were previously reserved for other spices (Campos *et al.*, 2018).

Added to the issues of the global context, other advantages also contributed for the spice to stand out at that time. The first important point is that this genre had already been used by indigenous peoples of Spanish America. This ensured a double benefit to the colonizers: in addition to knowing more about the whole process, they also knew that they would not encounter so many difficulties in cultivating a plant that had already been grown there. The second advantage presented by indigo is that it had a more viable transport logistics than other coloring spices, such as *pau-brasil* tree, for example, which took up much more space on vessels. Finally, its trade allowed Europeans to take advantage of the distribution network that already existed, since its route was compatible with that of other genres extracted from the New World (Chambouleyron; Cardoso, 2014).

In the case of Portuguese America, the production of indigo for commerce stood out from the second half of the 18th century onwards, especially in the 1760s. Such experience, in fact, was not as long-lasting as that of other colonial products. Some authors consider that the heyday of Portuguese indigo was only two generations old, since, in the 19th century, it was hampered by the rise of England in the dye trade and by the return of India as a supplier of the product (Alden, 1965).

This does not mean, however, that all previous Portuguese efforts should be ignored. On the contrary, the great interest of the metropolis in investigating and exploring the product is attested in the descriptions of travelers and in the concern of the employees in producing a good quality indigo that could be used in cloths, fabrics and canvas. The blue ink, according to Father João Daniel, was used "[...] in the factories of wool, silk, cotton, and other cloth; because not only blue cloths are dyed with it; but the black ones are so good, so that they come out very black, and don't fade, they are first dyed with indigo [...]" (Daniel, 1976, p. 425).

The incentive to plant this genre accompanied the various strategies adopted by the Portuguese in Portuguese America. During the 18th century, especially after the ministry of the Marquis of Pombal, the metropolis invested in endeavors to take advantage of the botanical resources of its emperor (Dean, 1989). In addition to the opportune global situation, the efforts for the development and processing of indigo are due to the commitment of the Portuguese Crown to revitalize the economy of the State of Maranhão and Grão-Pará since 1670. The significant increase in the trade in coloring drug[2], during the 17th and 18th centuries, was primarily responsible for creating alternatives that aimed to reduce the costs of the product, ensure a more stable production that did not rely exclusively on the producing areas of Asia. The solutions found by the metropolises were, just, to cultivate indigo in their own colonies from the acclimatization of the plant to new habitats. The dispute over the trade in this spice put at stake not only the interests of the Portuguese, but also those of Spaniards, French, English, etc. (Chambouleyron; Cardoso, 2014). In short, producing an efficient indigo crop was to show off and guarantee a good commercial position during the 18th century. The Portuguese knew this well.

The measures taken in the 17th century continued to have an impact and influence the decisions of the 18th century. In addition to intensifying the exploitation of indigo through cultivation, the Portuguese Crown started to encourage the processing of the genre from structures called "factories". Important and representative names sent to the colony supported the strategies adopted by the metropolis. The governor of Grão-Pará and Maranhão (1751-1759) Francisco Xavier de Mendonça Furtado was one of the political figures who played an extremely important role in the indigo trade. In one of his letters, written in Pará on November 15th, 1757 and addressed to the leaders of the General Company, the governor demonstrated his efforts to establish a precious production factory in Vila de Barcelos, whose lands were also very suitable for the cultivation of the product (Mendonça, 1963b; Sampaio, 1825). The governor took advantage of indigo cultivation to reinforce the importance of work and agriculture in the north of the colony.

Furtado believed that many efforts would be necessary for indigo to yield the good results desired by the Crown. However, before accepting that the colonists founded indigo factories, he considered it sensible to analyze whether they were capable of undertaking such sort of activity. The most important thing was to guarantee a quality indigo that could compete in the global market, especially with the indigo from Spanish America (Mendonça,

1963a). Concern about neighboring competition was real and justifiable. First Europeans to produce the paint on a commercial level in the New World, the Spaniards had great prominence in the indigo trade. Since the 16th century, they had been benefiting from *xiquilite*, a Central America indigo (*Indigofera suffruticosa*) used by the natives (Alden, 1965; Chambouleyron; Cardoso, 2014; Dean, 1989).

Another extremely important name for the indigo trade was that of the natural philosopher Alexandre Rodrigues Ferreira. An official correspondence sent to the naturalist reveals that he was tasked, by the Majesty himself, with "[...] to promote and animate in this captaincy [São José do Rio Negro] the culture and manufacture of indigo [...] ". Ferreira seems to have carried out the activities to which he was assigned with great commitment. As well as Furtado, the philosopher understood that in order to develop indigo culture satisfactorily, the colonists needed a large amount of labor to be available for them. Therefore, he encouraged the use of the work of enslaved Africans, using "laziness"[3] of the natives as his main argument. Another justification was that it was solving the issue of the increasingly reduced number of indigenous labor, since most of the natives employed in royal expeditions ended up dying or deserting (Ferreira, 1983). Ferreira's defense of the use of black slaves was in line with the measures of the Portuguese Crown that encouraged the slave trade to the Amazon region, especially during the period of the General Company of Grão-Pará and Maranhão (Souza Júnior, 2013).

Managing his activities as a naturalist with his responsibilities towards the Portuguese Crown (Silva, 1995), Alexandre Rodrigues Ferreira used his writings to detail the results, good or bad, that the residents had been obtaining both in their swiddens and in their indigo factories. The complaints were not just about unsuccessful crops. Ferreira also recorded the colony's debtors, especially those who had bought slaves on credit to be employed on the plantations. This was the case of Captain Paulino da Silva Rego who, despite "[...] buying two slaves for [...] his growing and manufacture, not only had he not employed them in the activity, which paid them, but to this day he still has not paid the company." (Ferreira, 1983, p. 80).

Identifying what was being planted was significant. In the colony, the recommendations were that those who really wanted to dedicate themselves to indigo, should leave all other cultures aside, because, in this way, they would not have their workforce dedicated to other crops other than this one. If the Portuguese Crown wanted to

continue diversifying the plantations, Ferreira suggested that they also multiply the "arms" available for this endeavor. By mentioning the example of less affluent farmers, he demonstrates the importance of selling on credit and paying the Company with indigo samples. This last practice marked the beginning of the culture of the crop and served to help the less affluent settlers who needed to stop planting subsistence foods, such as cassava, to cultivate what was required by the metropolis (Ferreira, 1983; Lima, 1953). One of Ferreira's roles was, precisely, to monitor who was complying, or not, with such requirements. Thus, as other travelers, he had to observe the two processes indispensable for the indigo trade: its planting and processing, or manufacture, as the naturalist used to name it.

Cultivate to benefit

The production of indigo for commercialization began when Portugal adopted alternatives that aimed to vary the agriculture of its colonies. The intention of the metropolis was that its domains could yield even more profits from the expansion and development of manufactures. However, before demanding the cultivation of any species, the Portuguese Crown needed to know if, in fact, the local lands were suitable. The work of officials, such as natural philosophers, was essential in this process. By providing a wide network of information, they made it possible for the metropolis to know and dominate, in a profound way, the economic potential of its colonies. In the case of indigo, the fact that it was already spread across the New World allowed the Crown to encourage its cultivation without major difficulties. Its cultivation, throughout the 18th century, was not restricted to the Amazon rainforest, but, on the contrary, gained prominence in other places, such as in Rio de Janeiro from 1749 onwards (Dean, 1989; Alden, 1965; Pesavento; Monteiro, 2006; Domingues, 2001).

The village directors were the main responsible ones for the development and success of monocultures, as they were in charge of ordering and supervising what the residents should produce (Ferreira, 1983). It was from the new structure of control and administration of the Amazon, instituted, especially, with the Directory of indigenous, that they started to occupy royal positions and functions (Vale, 2016). The directors received some instructions so that they could perform their tasks correctly with "honor and zeal". In addition to the increase in population, these measures aimed at the development of commerce. Alexandre Rodrigues Ferreira (1983) devoted a large part of his writings to instructions on planting indigo. It was important to present an efficient work that would serve as an example to the other inhabitants so that they would also be interested in the gender, making "[...] the

crop prosper, and consequently the interests of those residents, and [...] of the real farm." (Sampaio, 1825, p.36).

In order for the indigo crop to stand out, first of all, it was recommended that the seeds were collected, whenever they were ripe, and peeled in a pestle using the same method used for rice. The most fertile lands had to be prepared in the "fresh" (rainy) season so that they could quench their "thirst with the dews of the atmosphere". In case of extreme drought, the indigo had to be watered, but if, on the other hand, the land was very waterlogged, care had to be taken so that the plant did not rot, observing symptoms such as the pallor of its leaves. Plants should not be grown too close or too far from each other. Weeding had to be done every 2 months so that the weeds would not cover nor suffocate them. For cutting, the plant ripeness should be waited, carefully observing the parts that could be pruned. Some places, such as the gravel pits - from which gravel is taken - and the villages full of leaf-cutting ants (genus Atta), were also identified in order to prevent probable agricultural failures (Ferreira, 1983).

Besides presenting the strategies and requirements adopted by Portugal, the documents left by Ferreira also denounce the non-compliance of some residents and congratulate the good results of others. The practice of praising, in addition to informing about the most profitable lands in the colony, influenced other residents to do the same. The reports were used, above all, for Portugal to follow the progress and/or returns that Amazonian agriculture had been showing. "The swiddens, their size, how they are planted, and what in pounds or arrobas they can produce, [...]" should be personally inspected by the director, so that they could collect the promises of harvest from the residents (Ferreira, 1983, p. 533-534).

More than reporting the individual performance of the villages, the directors' visits to the swiddens were also important to define how much indigo each colonist should deliver to the Portuguese Crown. This amount was calculated proportionally to the situation in which the plantations were, that is, those that were showing better results, consequently, should deliver a greater volume of the product than those with worse conditions. Once the inspection had been carried out and the amount to be paid had been defined, the residents were responsible for delivering the genre, every month, to the director, who, in turn, would have to send it to Portugal. Satisfactions and explanations were demanded from settlers who were unable to deliver what had been agreed upon. It is important to emphasize that the

indigo delivered by the colonists must already be ready for trade, that is, it could only go to the Old World if it was already manufactured (Ferreira, 1983). This means that, between the cultivation and the trade of indigo, there was another extremely important stage: the place where it was processed.

The indigo factories

Responsible for producing what Alexandre Rodrigues Ferreira (1983, p. 649-650) called "[...] the best that has been exported from Brazil so far [...]", indigo factories can be understood as spaces where, in addition to applying already conceived knowledge, they also produced knowledge. In the 18th century, coloring drugs became a fertile field for investigations in the metropolises. The experiments could be carried out from the cultivation routine to the last phase of the process. By bringing together practices, people, capital and artifacts, the factories were not restricted to just processing the material, but also allowed new methods to be tested. The Portuguese Crown, guided by the illustrated concept that defended the exchange of a fundamental certainty for observation and practice, encouraged such experiences (Santos, 2009; Reis, 2014, p.37-59) and demanded "[...] always the best manufactured, even if it was less, to the poorly manufactured, even if it was more". The contributions consisted of making a large number of indigenous people available for the swiddens and carpenter officers for the buildings. Constructions and improvements were also valued by the metropolis (Ferreira, 1983).

The settlers received instructions and recipes for the processing of indigo, as well as cultivation. In addition to pointing out Portugal's main concerns, the analysis of such documents helps to understand the step through which the newly harvested plant should go. The first process consisted of cooking it in large cauldrons or pans. Despite not being carried out by everyone, this stage aimed to facilitate the extraction of the ink that began to be obtained from the first moment. Cooked or not, all the plants had to be placed inside a tank with water (Ferreira, 1983), denominated as "tank to rot". The amount of water used should be enough to cover the indigo, leaving it slightly submerged with the use of a moderate weight that could be exerted by wooden logs. During this step, it was important to ensure that the plants were not being compressed underwater. The recommendation was that the indigo was left in the tank for the time it was "tried" and "[...] not for the time established by recipes formulated in very different climates" (Alden, 1965, p.36; Daniel, 1976, p.425; Ferreira,

1983, p.83). The justification for the importance of observing the exact time, according to the climatic conditions of the North of the colony, was that:

> [...] it was necessary, in the rotting tank, to show a loaded dye, from where it had to pass through its faucet to the second lower tank, called the beating, because this second operation was carried out in it, until the bluish dye remained in the tank, that level, which was easier to experience than to explain (Ferreira, 1983, p. 98).

This excerpt sums up very well what the experimentation process consisted of: some techniques could only be understood or discovered when tested. This fact, however, did not eliminate the need for additional information. After passing through the beating tank, in which shovels, sticks or pieces of wood (Alden, 1965; Daniel, 1976) were used, the separation of the plant starch from the water was recommended. If the bottom of the tank had a proportional slope, this step would be even easier. The use of other substances such as urine or lemon juice, as suggested buy some, was not advisable at this time. After being separated, the starch should be placed in conical-shaped bags and perforated at the bottom so that the remaining water could also be removed. Finally, the settlers had to ensure that the starch did not dry out in the sun, since, although this accelerated the process, it also ended up having enormous consequences, such as changing the color and losing a large portion of the processed dough. The best thing was "[...] to spend it drying in the shade, in tents covered with straw, and set up in ventilated places." (Ferreira, 1983, p.98-99).

Although the recommendations served to standardize the process, it obviously had variations from one factory to another. While some manufactured the entire plant, others, in order to improve the product and obtain a more pigmented ink, benefited from the leaves separated from the seeds (Alden, 1965; Daniel, 1976). The 18th century renewal of the bases of knowledge, which took place both in Portugal and in its colonies (Conceição, 2019), allowed different processes to emerge and to be validated. Practice meant that many techniques were included, adapted or excluded. An example of this is that more tanks started to be built in the indigo factories after the settlers observed that the amount of plants placed in each one could not be very large, as this ended up interfering with the "rotting" process (fermentation) (Ferreira, 1983).

The mistakes and successes were, little by little, setting new practices and knowledge. The mistakes and successes were, little by little, configuring new practices and knowledge. The changes, in addition to improving the structures, aimed to generate even

more profits for the colonists and the metropolis from the reduction of expenses and the time for processing the product. Measures adopted by the colonel and governor of the Captaincy of São José do Rio Negro, Manoel da Gama Lobo de Almada, exemplify this well. After realizing that 16 to 20 people were needed to beat the indigo of 2 troughs for 2 hours every afternoon, he created a method to perform the operation "[...] in less time and with fewer people [...]". Almada determined that a wooden shaft be placed horizontally over the beating trough and be moved by two 10-year-old boys. Alone, they had to perform all the work that was done by 8 women. After verifying that he could reproduce the fact in 2 other troughs, the colonel concluded that, through his measurements, he would save the work of 22 people in the factory (Ferreira, 1983).

The changes proposed by Almada seem to have had the expected effects. The colonel was congratulated for carrying out with zeal the culture and manufacture of indigo (Lima, 1953). Reports of satisfactory productions obtained by residents who would have followed their instructions also appear in eighteenth-century sources. Almada, however, was not only in charge of improving the factories. In 1785, he was given other important tasks, such as inspecting and recording the expenses of the indigo factory in the fortress of São Gabriel (a district in the upper part of the Rio Negro). The colonel was responsible for informing everything that was spent on supplies, goods, materials used and payment of the workers' journeys (indigenous and overseers). The report of all accounts would have to be sent along with the shipment of indigo portions, which, in turn, would have to be separated and identified according to the quality of each one (Ferreira, 1983).

The Directory of Indians and working hours

Although the most targeted by the Portuguese Crown was the adoption of enslaved black workforce, what predominated in the colonization of Amazonas was the exploitation of indigenous workers. During the 16th and 17th centuries, the main destination for enslaved African was the sugar mills in the Northeast (Souza Júnior, 2013). Since it was not the main route of the slave trade, in the North, the number of slaves was considered small to meet all the demand. The low quantity of slaves available added to the great demand of the colonizers, was responsible for increasing the (Ferreira, 1983; Mendonça, 1963a). The solution found, since the beginning of the colonization of Amazonas, was the exploitation of its native populations that presented a high demographic density.

The sources show that the main employment of the indigenous people, especially in the first half of the 18th century, was in the collection of drugs from the hinterland[4]. This did not happen by accident. Using those who knew what they were doing, since they already carried out these activities and knew the whole territory, was an advantage that the settlers could not lose. The second half of the 18th century brought some changes in this regard. With the Indigenous Population Freedom Act (1755) and the elaboration of the Directory (1755), the General Trading Company of Grão-Pará and Maranhão, also newly created, undertook to introduce enslaved blacks. However, the high demand for workers added to other factors, such as the fact that the settlers preferred to keep the indigenous people who were previously their slaves on the grounds that they did not have the money to buy blacks from Africa, made the workforce of the natives continued to be used (Souza Júnior, 2013).

The documents found in Ferreira's sources, as well as the actual period of effective exploitation of indigo, date after the granting of freedom to the indigenous people and the introduction of the Law on the Directory of Indians. Along with the end of the guardianship exercised by the missionaries, these measures aimed to make the natives stable residents of the villages and, consequently, producers of their wealth. In other words, it is possible to say that the Directory was a strategy adopted by the Portuguese Crown to regulate indigenous work, which was previously controlled by missionaries (Coelho, 2006). Through a regulation, the aim was to distribute the labor of all men considered capable (with the exception of the indigenous elite) in royal or private services, in common swiddens and on collection trips (Roller, 2013). Francisco Xavier de Mendonça Furtado had already outlined some of these ideas around 1751. His writings leave no doubt with regard to his contribution to the adoption of such measures. According to the governor, a new Statute should be created to organize and change the system that was in place. The indigenous people considered "civilized and obedient" should be under the responsibility of the governors so that they could "[...] ruin the common enemy of this State [...], [...] the Regulation of Missions [...]", blamed for reducing "[...] two great captaincies, [...] to the last scarcity and misery." (Mendonça, 1963a, p.80-82).

The Directory Law, considered the heyday of Marquês de Pombal's indigenist policy, guaranteed a direct administration of the villages that, for so long, were under the command of the missionaries. The natives, however, were not yet completely free. The control, taken from the hands of the Catholic Church, was passed to directors who were to be chosen and

appointed by governors. Two groups were formed: one had to remain in the villages, while the other had to be divided among the settlers. Indigenous people between 13 and 60 years of age were considered suitable for work. It was necessary to report on all workers employed. Their services were to be used for a period of 6 months and payment for the journeys had to be made to the director of each village as soon as a number of workers was granted. It was common for settlers not to comply with payment orders, most of the time justifying the lack of budgets. In an attempt to resolve this issue, the directors were responsible for transferring only 1/3 of the salary to the indigenous people. The remaining 2/3 were to be kept in a village safe and could only be paid at the end of the work, if the indigenous people had not fled. If they disbanded, the money was returned to the settlers. The rules also guaranteed that, if ill-treatment was proven, the residents would lose all the money deposited, in addition to being obliged to pay double the amount to the workers involved (Ferreira, 1983; Souza Júnior, 2013).

We can imagine how all this was hardly applied in practice. Records, such as those in Almada, reveal that boys under the age of 13 were already employed in services. Among Ferreira's documents, we also find an account from August 12, 1786, about the "mistake" made when paying a lower salary to indigenous women in the indigo factories in the village of Barcelos. Complaints about the lack of "arms" and the means to pay for the indigenous people's journeys appeared frequently in the 1700s. The use the settlers made of the available indigenous people was also a reason for pointing out and criticizing. The little manpower they had, according to Ferreira, was either wasted in drug harvesting, instead of being used in agriculture, or was divided among several plantations. Some settlers would only have changed their thinking and given more priority to indigo than to other crops, such as rice, coffee and cotton, when the Portuguese Crown decided to pay 2$000 *réis* for the pound of the product that, previously, used to be sold between 700 and 1$100 *réis*. The financial incentive was accompanied by the renewal of other necessary measures and the granting of more indigenous people who should solve, in part, the problem of lack of "arms" (Ferreira, 1983; Lima, 1953).

Experiences, such as those carried out by Almada himself, had already proven that the inclusion of techniques was responsible for reducing the number of manpower needed in factories, allowing it to be intended to other sectors. Crops, including other genres, were the main places recommended for such relocation. In a year, at least 2 clearings needed to be done so that the total value of indigo produced corresponded to what was required. For this,

the assistance of 2 overseers was considered indispensable. White men should be chosen for the position, whose payment was 30$000 per year, about 107 *réis* a day, if we consider the 280 days of work (Ferreira, 1983, p. 181-183). The value is very low when compared to the payment of other professionals at the time. Giovanni Angelo Brunelli, for example, received around 50$000 *réis* per month (not including the amount sent directly to his family) while participating in the Portuguese Commission for the Demarcation of Limits in (Papavero *et al.*, 2010). This means that the monthly payment of an astronomer like Brunelli was 20$000 *réis* the annual salary of an overseer. Indigenous people pay was even lower. According to the document sent to the colonel, 16 indigenous people were needed to build a swidden in 12 days, whose wages, including their livelihoods, were equivalent to 60 *réis* a day. On labor days at factories, women earned about 45 *réis* a day, while men earned 40 *réis*. Assuming that the factory employed 8 women and 5 men, its expense would be approximately 157$ *réis*[5]. These were precisely the expenses that the colonists wanted to reduce (Ferreira, 1983).

Discussions about costs and the use of workers appear in other passages about indigo production. Alexandre Rodrigues Ferreira recommended that the settlers, where they did not have much supply of labor, should employ their workers in the fields and in the manufacture of items that could not be exported without undergoing processing, such as indigo and annatto (*Bixa orellana*). Other manufactures, such as cotton, could benefit in the Old World and, therefore, should be under the responsibility of the metropolis and not the colony. Another idea defended by the natural philosopher was that indigo, coffee and tobacco, considered the three most precious products, should be exclusive to the captaincy of São José do Rio Negro. Ferreira's main argument was that competition harmed economic interests, as farmers and workers in Pará would have a great advantage by not paying transport freight and obtaining labor more easily. As a result of reduced expenses, they could charge less for the pound of indigo, reducing its commercial value. Certainly, this was not what they expected from "[...] the most well-accepted indigo in the entire state [...]" (Ferreira, 1983, p. 733). The objective, on the contrary, was that the genre could be sold at a good price, meeting the demand it had in Europe.

"Precious genres, and marketable all over the world"

The idea of wealth appears marked, in the 17th and 18th centuries, by perceptions about trade, circulation, value, price, income and interest (Foucault, 1999). This was the set of attractions that guided the description of eighteenth-century Europeans. Talking about

"precious and marketable products all over the world", such as indigo, cocoa, sugar, balm and coffee, proved to be as important as citing gold, silver and diamonds. The value of these items was associated with the availability they had in Amazônia (Daniel, 1976, p.382-383). Alexandre Rodrigues Ferreira was concerned with showing how the total obtained from the production of indigo was affected by the difficulties faced by the settlers. The lack of resources to pay for and support the journeys of the indigenous people was just one of the examples he presented. Obviously, low production and high spending negatively impact the business (Ferreira, 1983).

The comparison with the prices reached by indigo in the ports of France (Table 1), demonstrates how the natural philosopher was committed to improving (or equating) the value of the Portuguese genre in the world market. After choosing two French destinations (Bordeaux and Nantes), Ferreira analyzed the prices obtained for 4 different varieties of indigo, which he called *azul* ("blue"), *misturado* ("mixed"), *cor de cobre fino* ("color of fine copper") and *ordinário* ("ordinary"). His survey shows that the bluer and purer the pigment, the greater its commercial value. Therefore, ensuring a good processing of the product was synonymous with ensuring higher prices in the Old World.

Table 1 – Indigo prices in French ports.

Ports	**Price of indigo in France**[6]				**Reduction of the intrinsic value for the Portuguese currency**		**Numeral value for Portuguese currency**	
Bordeaux	**£**	**S.**	**£**	**S.**				
Blue, violet of São-Domingo	8	10	9	8	1440	1530	1700	1800
Called "misturado"	7	5	8	5	1232	1262	1450	1650
Called "cor de cobre fino"	6	15	0	0	11471/2	0	1350	0
Called "ordinário"	6	8	6	10	1088	1105	1280	1300
Nantes	**£**	**S.**	**£**	**S.**				
Anil cor de cobre fino ("Blue color of fine copper")	6	10	6	15	1105	11471/2	1300	1350
Ordinário ("ordinary")	6	8	6	10	1088	1105	1280	1300
Misturado ("mixed")	8	0	9	0	1360	1530	1600	1800
Azul ("Blue")	10	0	11	0	1700	1870	2000	2200

Source: Ferreira, 1983, p.198.

In general, the encouragement of European States to men of science and letters marked the 18th century. More than just an ideological and philosophical movement, the Enlightenment promoted broad changes in the social and administrative spheres. Based on networks structured around knowledge production centers, Portugal adopted some strategies during the 18th century (Kury, 2004). Investigations into the production of indigo and its numerous experiences emerged within this context. It was common for experienced workers to be sent to run their factories (Ferreira, 1983). The concern with classifications also became more systematic after the adoption of Linnaeus' system (Kury, 2004). In the case of indigo, in addition to identifying its genus, it was necessary to point out the marketable variations of the plant. As Ferreira demonstrated, this cataloging used to be carried out according to the intensity of the color and its consequent higher quality. In addition to the variations already presented, two other types of indigo appear in the list of supplies needed for the philosophical expedition of Ferreira and his assistants through Mato Grosso. The list required both flower of indigo and fine indigo (Lima, 1953).

Considered one of the "[...] rich and precious genres for [...] inland and foreign trade [...]", indigo was both sold in the ports of Lisbon and bought by farmers in the colony who did not have it in their lands (Ferreira, 1983, p.166; 675). The purchase of slaves was also another common employment given to the genre, especially the one obtained in Cape Verde (Carreira, 1988a). It cannot be denied that, in fact, there were numerous efforts for the indigo trade to progress. Although they later failed, factories of the genre were important spaces for commercial and experimental development, as they allowed the metropolis to test new and different methods to be used (Reis, 2014). Coming to name old settlements, albeit for a relatively short period of time, they became local references (Moraes, 1860). Obviously, to guarantee good results, it was necessary that the gains were greater than the expenses. Therefore, controlling the expenses of the entire process and the profits obtained from sales was extremely necessary.

The elaboration of increasingly complex and extensive reports can be explained from the political context established in the metropolis, especially in the second half of the 18th century. It was exactly in this period that the conceptions of Political Arithmetic began to greatly influence the administration of Portugal and its colonies. Born in England in the 17th century, this aspect was present in the Portuguese Crown during the government of D. José

I (1750-1777) and until the beginning of the regency years of Prince D. João (1792-1807). According to the studies, the policy had to be decided from some statistics, such as the data on the population and the businesses, for example. These practices, in general, ended up being responsible for creating other administration techniques and for stimulating the professionalization of their employees (Santos, A., 2008). The Crown's concern for detailed records can be verified from the requirement of annual reports containing data such as: the number and name of indigenous people employed on the plantations, the payment they were given, the general expenses they had with the drugs in the hinterland and the earnings they provided. The directors were also required to inform which residents had provided the promised amount of food and which still had debts to be paid. This ensured that charges were documented and could be made later (Ferreira, 1983).

Conclusion

Promises for harvests and production of better and greater amounts of indigo are extremely common in the historical records produced by Ferreira (Lima, 1953). The values presented always accompanied forecasts of hope for the coming years. From the settlers to the directors and governors, everyone was charged. It was common for optimistic forecasts not to be fulfilled in practice and for excuses for low results to become more frequent than expected (Ferreira, 1983). The contributions of the Portuguese administration consisted in the supply of manpower and subsistence allowances through exemptions, such as the free dispatch of incoming and outgoing of the genre. Although the sources make it clear that the support, especially with regard to the supply of workers, did not meet the needs of the factories, we find reports of help provided by the metropolis through the concession of some indigenous people or slaves. The high payment for indigo was also a way of encouraging the discouraged settlers.

In one of the descriptions, Alexandre Rodrigues Ferreira stated that, at a given time, around 2$000 *réis* was paid for the pound of samples of the genre. Everything indicates that this might solve the problems only for a time, since the help offered was momentary and specific. The recommendation that the workers granted be employed only in the main activities shows that the shortage of manpower was a very present issue in the reality of the region. Ferreira believed that one of the ways to improve the conditions in which the indigo farms and factories found themselves was to increase direct supervision of the metropolis.

According to him, this was necessary for the orders to be carried out by the residents who, in a way, were forsaken (Ferreira, 1983).

Despite its importance and the insistence of the metropolis, which, on May 23, 1761, had even exempted the payment of its customs duties for 10 years, the genre was not among the ten most exported products by the Companhia Geral do Grão-Pará. and Maranhão. According to António Carreira, the Portuguese profit achieved with indigo was slightly higher than with silk, since they would have obtained around 1,851,450 *réis* by sending 1,698.5 *arráteis* of the genre. As each *arrátel* corresponded to 459g, we can say that the Company exported approximately 779.61 kg of indigo to Lisbon. As well as the other drugs in the hinterland, this genre was also exported by settlers, in the form of consignment, on the Company's ships. Considering the years 1763, 1764, 1774 and 1777, this regime was responsible for exporting 35 *arráteis* (16.06 kg) from Maranhão and 18 arrobas and 39 *arráteis* from Pará (282.28 kg), sold, respectively, for 49$630 and 493$664 *réis* (Carreira, 1988a; Carreira, 1988b). It is noticeable that the amount of indigo exported from Pará was higher than that from Maranhão.

The frequency with which reports and criticisms regarding the low offers for the pound of indigo appear in eighteenth-century sources is high. Unsuccessful experiences and the lack of manpower that could be used in crops and factories are used as the main justifications. Inferior product quality was also another factor responsible for lower-than-expected prices. According to Ferreira, it was common for settlers to falsify indigo samples from other elements, such as coal dust, *tabatinga* and rust. He also mentions decayed and lower quality (wild) indigo. The bad result could be due to several problems encountered in the cultivation and processing of the genre. Among these, the following stood out: harvesting at the wrong time; the infusion of hard, woody branches along with the leaves; fermentation for more or less time than necessary; and the boxing of the still damp product. All these errors and unsuccessful experiments ended up frustrating the Portuguese Crown's incentives, exemptions and attempts to establish a solid culture (Ferreira, 1983).

All this factors together probably explains why the Portuguese Crown did not dedicate itself only to one of the hinterland's drugs, nor exclusively to cultivation. Reconciling the extraction of other natural resources was essential to ensure that the trade balance was in favor of the metropolis. Through the cultivation of species such as cocoa and indigo, Europeans tried to dominate the environment and establish an effective colonization. However, as demonstrated by the many failed attempts, they encountered a number of

difficulties in reproducing their techniques in the rainforest. The endeavors were not always successful. Therefore, the diversification of the economy provided greater commercial security to the colonizers. The cultivation of indigo appears in this context. At the same time that it allowed Europeans to experiment with new planting, harvesting and processing techniques, indigo could also be added to other resources already explored, contributing to the diversification and expansion of the local economy. The more agricultural endeavors were put into practice, the more the colonizers would be able to reaffirm their ideas of defense of agriculture and the employment of slave labor.

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[1] *Anil, anileira* or *índigo* are some of the names given to the species of Indigofera, a genus that has around 700 species spread across Asia, tropical Africa, Australia, North America and South America. In Brazil, in addition to *I. truxillensis* and *I. hirsuta*, it is possible to find *I. suffruticosa* (Campos *et al.*, 2018).

[2] We chose to keep the term used in the historical sources. Probably originated from the Dutch "*droog*", the word "drug" had the meaning of dry products and had been used used with different meanings since the 16th century. In addition to appearing in dry cleaning, the word also referred to the natural elements that were used in gastronomy, as a seasoning or form of pleasure, and in the process of healing the sick, when it became synonymous with the term "medicine" and could be classified as vegetable, mineral or animal (Carneiro, 2005).

[3] The imagination of "lazy" indigenous people who did not know how to explore their lands in the best possible way began to be built (and used as a justification for colonization) since the arrival of the first Europeans in America.

[4] Nomenclature used in historical sources to describe the spices located and harvested in the interior of the Amazon rainforest.

[5] The total amount of expenses presented in the document is 157$600 *réis*. However, considering the numbers reported, we obtain the value of 156$800 *réis*. The difference is probably due to the approximations used and, therefore, we chose to present a rounded value of 157$ *réis*.

[6] The fact that the price is presented in English currency, even though it is sold in French ports, is very significant and proves that, in fact, England had already begun to control this market. In addition to the pound symbol, Ferreira uses another abbreviation (S.). This is probably the shillings, a divisional currency used by the English.

Sobre os autores

Nathália Moro
Doutoranda, Mestra (2021) e Licenciada (2019) em História pela Universidade Estadual de Maringá (UEM). Possui experiência em História das Ciências com ênfase em História da Alimentação e História das Ciências Naturais enquanto pesquisadora no Laboratório de História, Ciências e Ambiente (LHC-UEM).
Universidade Estadual de Maringá
E-mail: nathaliamoro@hotmail.com
ORCID: https://orcid.org/0000-0002-5944-3151

Christian Fausto Moraes dos Santos
Pós-Doutorado em História das Ciências pelo Consejo Superior de Investigaciones Científicas de Barcelona (CSIC) Espanha em 2015, Pós-Doutorado em História da Cultura pela Universidade Federal de Minas Gerais (UFMG) Brasil em 2008, Doutorado em Ciências, subárea História das Ciências pela Fundação Oswaldo Cruz (FIOCRUZ) Brasil e pelo Instituto de Estudos do Além-Mar em Portugal em 2005, mestrado em Geografia, subárea História das Ciências pela Universidade Estadual de Maringá (UEM) Brasil em 2002 e graduação em História pela Universidade Estadual de Maringá (UEM) Brasil em 1998. Atualmente é professor associado da Universidade Estadual de Maringá, atuando nos cursos de Graduação, Mestrado e Doutorado em Departamento de História.
Universidade Estadual de Maringá
E-mail: chrfausto@gmail.com
ORCID: https://orcid.org/0000-0002-7537-4547

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