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3/ African knowledge transfer in Early Modern Portugal: Enslaved people and rice cultivation in Tagus and Sado rivers*

Miguel CARMO, Joana SOUSA, Pedro VARELA, Ricardo VENTURA, Manuel BIVAR **

ABSTRACT: *The origins of rice cultivation on the margins of the rivers Sado and Tagus, and the accompanying agroecological and technological changes have not been studied hitherto. Little is known about the dynamics of the salt-fresh water frontiers in those rivers, namely the conversion of marshes into rice or salt paddies, or the role of Black people brought from West Africa and enslaved along the Sado and Tagus rivers. This article presents exploratory research on the links between these newcomers, arriving from places where such transformations were common, and the production of rice during Early Modern Portugal. Over-simplified historiographies have (re)dispossessed enslaved people and their descendants from any historical transformative role. Yet, studies by Judith Carney, Edda Fields-Black, Peter Wood, Daniel Littlefield, and others place enslaved people from West Africa at the core of technology transfer and agroecological change in the Americas. On the European side of the Atlantic, this line of inquiry has yet to be followed. Our study contributes to a more enduring critical approach to the socioenvironmental history of the subaltern in enslaving societies. We propose a research hypothesis reaching beyond the colonial nature-society divide and its implied, further objectification of the enslaved Black person as limited to their metabolic condition. The largely unknown history of rice in the Sado and the Tagus is connected to the untold history of enslaved Black people in Portugal and this article offers a preliminary formulation of these connections.*

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ABSTRACT: *Le origini della coltivazione del riso ai margini dei fiumi Sado e Tago e le relative trasformazioni agroecologiche e tecnologiche non sono state ancora oggetto di studio. Conosciamo molto poco della dinamica delle "frontiere d'acqua" dolce e salata in quei fiumi, vale a dire la conversione delle paludi in risaie o saline, o il ruolo delle persone di colore provenienti dall'Africa occidentale e ridotte in schiavitù lungo i fiumi Sado e Tago. Questo articolo presenta una ricerca innovativa sui legami tra questi nuovi arrivati, provenienti da luoghi in cui tali trasformazioni erano comuni, e la produzione di riso in Portogallo durante la prima età moderna. Ricostruzioni storiche troppo semplicistiche hanno (ri)espropriato gli schiavi e i loro discendenti da qualsiasi ruolo storico trasformativo. Tuttavia, gli studi di Judith Carney, Edda Fields-Black, Peter Wood, Daniel Littlefield e di altri, collocano gli schiavi provenienti dall'Africa occidentale al centro del trasferimento tecnologico e del cambiamento agroecologico nelle Americhe. Sulla sponda europea dell'Atlantico, questa linea di indagine non è stata ancora seguita. Il nostro studio contribuisce a definire un approccio critico più solido nei confronti della storia socio-ambientale dei subalterni nelle società schiaviste. Proponiamo un'ipotesi di ricerca che vada oltre la contrapposizione tra natura-società nelle aree coloniali e l'implicita e ulteriore oggettivazione che essa comporta nei confronti degli schiavi di colore, limitandosi alla loro condizione metabolica. La storia poco nota della coltivazione di riso nel Sado e nel Tago è collegata alla storia non raccontata degli schiavi neri in Portogallo e questo articolo offre una formulazione preliminare di queste connessioni.*

1. Introduction

The Sado River runs north from the mountains of the Alentejo to Alcácer do Sal and Setúbal, where it flows to the Atlantic Ocean, passing through several villages. The Tagus is a larger river, the longest in the Iberian Peninsula. It emerges in Spain and empties into the Atlantic near Lisbon, north of the Sado. Both develop large floodplains and estuaries, on the margins of which various towns developed during the Modern period. Little is known about the beginning of rice cultivation on the margins of the Sado and Tagus and the agroecological, technological and landscape changes that it entailed. Salt economy received more attention, but its labour and ecological aspects were less developed[1]. In particular, the history of the salt-fresh water frontier in those rivers, namely the conversion of marshes into rice or salt paddies or the ways of producing rice has not yet been uncovered. Moreover, the role played by enslaved Black people brought from West Africa – where these transformations and products were common - is yet to be unpacked.

Most historiography accepts the idea that rice was absent from Early Modern Portuguese agriculture. According to these views, rice would have been introduced to the Iberian Peninsula during the Arab period (8th-12th centuries) and rice crops were present during the reign of King Dinis (1279-1325). In the first half of the 16th century there were some limited developments on the Tagus, followed by a gap of about 200 years until rice crops timidly reappeared in the second half of the 1700s. Finally, rice cultivation took off from the mid-19th century, fostered by the first Portuguese agrarian capitalists in the context of liberal reforms[2]. However, this chronology has

* Thanks are due to Catarina Leal for the production of Figure 1 and to Ana Naomi de Sousa for the careful review of the English writing. We are also grateful to two anonymous reviewers for their critical and detailed contributions. This work was supported by Fundação para a Ciência e a Tecnologia (Portugal): I&D Pluriannual Funding for research units (CES-UC: UIDP/50012/2020 and NOVA IHC: UIDP/04209/2020) and individual grants CEECIND/04424/2017 (to J.S.) and SFRH/BD/129171/2017 (to P.V.).

** The authors contributed equally to the manuscript.

[1] RAU, Virgínia, *Estudos sobre a história do sal português*, Lisboa, Editorial Presença, 1984.

[2] SILVA, Manuel Vianna e, *Elementos para a história do arroz em Portugal*, Coimbra, Grémio Lavoura Beira Litoral, 1955, pp. 6-34, stated that between the reign of Dinis and the 18th century rice cultures «were abandoned for reasons unknown.» In the reign of José I (1750-1777) «the old culture resurfaces». This framework continues to be cited in recent works, namely: HAWTHORNE, Walter, *From Africa to Brazil: Culture, identity, and an Atlantic slave trade, 1600–1830*, Cambridge, Cambridge University Press, 2010, p. 141. Evidence of rice cultivation in the 16th century was given by: GODINHO, Vitorino Magalhães, *Os Descobrimentos e a Economia Mundial*, vol. II, Lisboa, Arcádia, 1965, p. 392, mentioning rice fields in 1546 in the Ota, Asseca and Muge marshes (Tagus). Recently Freire and Lains (FREIRE, Dulce, LAINS, Pedro, *An Agrarian History of Portugal, 1000-2000: Economic Development on the European Frontier*, Leiden, Brill, 2017, pp. 85-86, 144) takes up this data without further adding. On the development of rice in the 19th century, see: CORVO, João de Andrade, *Relatório sobre a cultura do arroz em Portugal e sua influência na saúde pública*, Lisboa, Imprensa Nacional, 1860; MARTINS, Conceição Andrade, «Opções económicas e influência política de uma família burguesa oitocentista: o caso de São Romão e José Maria dos Santos», in *Análise Social*, 27, 2/1992, pp. 367-404.

been challenged. Jorge Custódio refers to the existence of a tradition of cultivating *arroz da terra* (land rice) in the 15th and 16th centuries, as well as persistent rice-based dietary habits in the following centuries that suggest local farming practices[3].

From the late 15th to mid-16th centuries, enslaved people are known to have participated in salt extraction in the Sado estuary, near Setúbal, where they were sent by their farm masters during the summer[4]. The presence of enslaved Africans in Lisbon and Setúbal, as well as in the nearby agricultural fields and estuarine activities of the Tagus and the Sado, is well documented[5]. It is therefore relevant to ask: what was the contribution of these people to the production of rice on the Sado and the Tagus between the 15th and 18th centuries? Our working hypothesis is that the unknown history of rice in these coastal landscapes is connected to the understudied history of enslaved Black people in Portugal.

Similar questions have been raised with regard to other regions of the Atlantic rim, on the American side, in what became known as the «black rice» thesis. Judith Carney departed from the pioneering work by historians Peter Wood and Daniel Littlefield and presented a comprehensive history of technology transfer from the rice-growing societies of Upper Guinea coast to South Carolina, in modern USA. At the core of her argument is the early shift to a rice tidal system based on the knowledge (and seeds of African rice, *Oryza glaberrima*) brought by enslaved Africans from the regions where these systems were long established[6]. Given the scarcity of documentary sources on the role of the enslaved farmers, who left no known written records, she adopted a «geographical perspective»[7] that establishes parallels between both sides of the Atlantic in terms of production systems, wetland adaptation, farming tools, rice processing and cooking, and language. In addition, she argued, by the end of the 18th century, «prejudiced European perceptions of African people and their skills»[8] placed them «in the background of rice history»[9].

[3] CUSTÓDIO, Jorge, «A Fábrica de descasque de arroz da Casa Cadaval. Património Industrial de Muge», in *Revista Cultural de Salvaterra de Magos*, 3, 2016, pp. 167-220, pp. 174-176.
[4] SAUNDERS, Alastair Corston de Custance M., *A social history of black slaves and freedmen in Portugal, 1441-1555*, Cambridge, Cambridge University Press, 1982, pp. 58, 86, 124.
[5] *Ibidem*, pp. 47-61; TINHORÃO, José Ramos, *Os Negros em Portugal: Uma Presença Silenciosa*, Lisboa, Caminho, 2018, pp. 101-114 [or. ed.: Lisboa, Caminho, 1988]; FONSECA, Jorge, *Escravos no Sul de Portugal: séculos XVI-XVII*, Lisboa, Vulgata, 2002, pp. 26, 37, 77-81; ALCÂNTARA, Ana, ROLDÃO, Cristina, CRUZ, Carlos, «Visita à Setúbal negra (séc. XV-XVIII): Desocultar a história local através da educação não formal», in *Mediações*, 7, 2/2019, pp. 66-85.
[6] CARNEY, Judith, *Black rice: the African origins of rice cultivation in the Americas*, Harvard University Press, 2001.
[7] *Ibidem*, p. 81. On Carney's method see HAWTHORNE, Walter, «From "Black Rice" to "Brown": Rethinking the History of Risiculture in the Seventeenth- and Eighteenth-Century Atlantic», in *The American historical review*, 115, 1/2010, pp. 151-163.
[8] CARNEY, Judith, *Black rice*, cit., p. 29.
[9] *Ibidem*, p. 149.

Later, Carney would also extend her argument to Brazil[10], which was partially contested by Walter Hawthorne's work on the development of rice plantations in the Portuguese captaincies of Maranhão and Pará[11]. In the dispute over the role attributed by Carney to Asian and African rice species, Hawthorne added various wild rice species of South America gathered by native people[12].

A strong debate ensued focused on the work of Carney that took the history of rice into a rich discussion about historical evidence and methodology[13]. The main criticism comes from three co-authors, who concluded that «slaves arrived in the Americas with certain skills, [...] some of them contributed ideas about rice cultivation», but «planters held the reins of power, had access to capital, experimented keenly, and in essence called the shots»[14]. The ideological bias of these authors was noted by Midlo Hall[15] and Hawthorne[16], who considered the criticisms of Carney's research, said to be based on weak evidence, to be paradoxical. Hawthorne asks whether the trio's archival evidence is «more accurate than the evidence that Carney derives from a "geographical perspective"»[17]. The incompatibilities between documentary research and synchronic analysis were long ago rejected by Carlo Ginzburg[18]. In the face of poorly documented subjects, and «for those who did not want to resign themselves to writing for the umpteenth time the history of the winner», non-documentary sources are useful «probes» to reach strata otherwise inaccessible[19]. Moreover, the «gaps» that open up in the documentation, and the rare cases in which a dialogical character appears should double the attention[20].

In fact, the paucity of documentary sources on rice cultivation in the trans-Atlantic world has led several researchers to call upon distinctive sources and strategies in impressive interdisciplinary approaches: comparative historical linguistics[21], botanical and biological

[10] CARNEY, Judith, «'With grains in her hair': rice in colonial Brazil», in *Slavery & Abolition*, 25, 1/2004, pp. 1-27.
[11] HAWTHORNE, Walter, *From Africa to Brazil*, cit., pp. 137-172.
[12] *Ibidem*, pp. 140-144.
[13] *The American Historical Review : The Question of "Black Rice"*, 115, 1/2010, pp. 123-171.
[14] ELTIS, David, MORGAN, Philip, RICHARDSON, David, «Agency and diaspora in Atlantic history: reassessing the African contribution to rice cultivation in the Americas,» in *The American Historical Review*, 112, 5/2007, pp. 1329-1358, p. 1357.
[15] HALL, Gwendolyn Midlo, «Africa and Africans in the African diaspora: the uses of relational databases,» in *The American Historical Review*, 115, 1/2010, pp. 136-150.
[16] HAWTHORNE, Walter, «From "Black Rice" to "Brown"», cit., pp. 151-163.
[17] *Ibidem*, p. 156.
[18] GINZBURG, Carlo, *História nocturna: uma decifração do Sabat*, Lisboa, Relógio D'Água, 1995, pp. 9-37 [ed. or.: *Storia notturna: una decifrazione del sabba*, Torino, Einaudi, 1989].
[19] *Ibidem*, pp. 21, 28.
[20] *Ibidem*, pp. 21, 24.
[21] FIELDS-BLACK, Edda, *Deep Roots: Rice Farmers in West Africa and the African Diaspora*, Bloomington, Indiana University Press, 2008; FIELDS-BLACK, Edda, «Untangling the many roots of West African mangrove rice farming: Rice technology in the Rio Nunez region, earliest times to c. 1800», in *The Journal of African History*, 49, 1/2008, pp. 1-21; CARNEY, Judith, *Black rice*, cit., pp. 93-97.

studies[22], agricultural archaeology and archaeobotany[23], toponymy[24], rice cooking practices and other cultural legacies[25].

These American rice histories are directly linked to Portugal. Our preliminary research suggests an Atlantic square of rice, with transits (of people, seeds and knowledge) between four vertices: West Africa, Brazil, South Carolina and Portugal. However, it is also necessary to consider, especially when it comes to studying the Portuguese floodplains and estuaries, the Mediterranean tradition of rice and the routes to the Indian Ocean. In fact, it has recently been proposed that the study of Atlantic and Indian oceans rice histories should be integrated[26].

There are only two species of domesticated rice in the world within 23 recognized species of the genus *Oryza,* spread over several continents. *O. sativa* was firstly domesticated in Southeast Asia or China, and it is the origin of current commercial varieties[27]. It was estimated that *O. glaberrima* was domesticated in West Africa 3000 years ago, in the Niger valley floodplains[28]. In 1500, Portuguese traders knew both types of rice through trade with Arabs, Black Africans, Italians and Spaniards, as well as with the Indian Ocean peoples[29]. There is an ancient rice tradition in Europe linked to remote Asian origins (the «Italian» and «Venetian» rices[30], those cultivated in southern Spain[31], the Portuguese «land rice»[32]), and new seaborne connections from the 15th century on with West Africa and then with Southeast Asia and East Africa. Most likely *O. sativa* was introduced onto the Upper Guinea coast by the Portuguese as early as the 16th

[22] FIELDS-BLACK, Edda, *Deep Roots,* cit., pp. 68-75, 137-160; ID., «Untangling», cit., pp. 1-21.
[23] LINARES, Olga, «Shell middens of lower Casamance and problems of Diola protohistory», in *West African Journal of Archaeology*, 1, 1971, pp. 23-54; FERGUSON, Leland, *Uncommon Ground: Archaeology and Early African America, 1650-1800*, Washington D.C., Smithsonian, 1992; CARNEY, Judith, *Black rice*, cit.
[24] CARNEY, Judith, *Black rice*, cit., pp. 175-176.
[25] HAWTHORNE, Walter, *From Africa to Brazil*, cit., pp. 137-172; CARNEY, Judith, *Black rice*, cit.
[26] BRAY, Francesca, COCLANIS, Peter, FIELDS-BLACK, Edda, SCHÄFER, Dagmar (eds.), *Rice: Global Networks and New Histories*, Cambridge, Cambridge University Press, 2015.
[27] SHARMA, Shatanjiw Das, *Rice: Origin, Antiquity and History*, New York, CRC Press, 2010, pp. 1-17; HUANG, Xuehui et al., «A map of rice genome variation reveals the origin of cultivated rice», in *Nature*, 490, 2012, pp. 497-503.
[28] WANG, Muhua et al., «The genome sequence of African rice (*Oryza glaberrima*) and evidence for independent domestication», in *Nature genetics*, 46, 9/2014, pp. 982-988; CARNEY, Judith, *Black rice*, cit., pp. 31-49; FIELDS-BLACK, Edda, *Deep Roots*, cit.
[29] HAWTHORNE, Walter, *From Africa to Brazil*, cit., p. 141; GODINHO, Vitorino Magalhães, *op. cit.,* pp. 380-395. In the 1510s, Portuguese ships were trading in Siam «much rice». LOURIDO, Rui D'Ávila, «European trade between Macao and Siam, from its beginnings to 1663», in *Journal of the Siam Society*, 84, 2/1996, pp. 75-101. Several documents show the shipment of rice in the Indian Ocean as a voyage supply (*despenseiro* or *mantimento* rice): e.g. ANTT, ref. PT/TT/CC/1/28/52 (1522).
[30] CAI, Xingxing et al., «The puzzle of Italian rice origin and evolution: determining genetic divergence and affinity of rice germplasm from Italy and Asia», in *PLoS One*, 8, 11/2013; HAWTHORNE, Walter, *From Africa to Brazil*, cit., p. 146.
[31] FARIA, Manuel Severim de, *Notícias de Portugal*, Discurso I, Lisboa, Off. Antonio Isidoro da Fonseca, 1740, p. 17 [ed. or.: Lisboa, Off. Craesbeeckiana, 1655]; SILVA, Manuel Vianna e, *op. cit.*, pp. 6-7; SHARMA, Shatanjiw Das, *Rice*, cit., p. 346;
[32] CUSTÓDIO, Jorge, *op. cit.*, p. 176.

century[33]. Rice became a global food staple during the 1500s, even if traded in lower quantities compared to the American rice plantation economy emerging in the 18th century[34]. The historical puzzle is not simple.

This article offers a preliminary formulation of the history of rice under slavery in the Sado and Tagus basins, and sets a framework for future research. Our work was based on bibliographic review and preliminary archive research, focusing on the interplays between agroecological change, co-production of knowledge, and slavery.

2. Filling the gaps: rice in the Sado and the Tagus from the 15th century

Rice was a common food in Lisbon between the 16th and 18th centuries. In 1551, one observer described cooked rice being sold on the streets of the city. He counted 27 women cooking rice on the street, among vendors of fried fish, couscous, plums and sweets[35]. One year later, another observer, João Brandão, described «fifty women, among them white and black, freed and captive women» selling rice[36]. In 1706, «black women selling corn, rice and fish on the stairs of the Rossio hospital» in Lisbon presented a petition to the king, claiming for their customary right («enjoyed by us and our ancestors since the world was the world») and complaining about the «violent» persecutions they suffered at the hands of the *corregidores*[37]. In 1697, the exemption from customs fees for the purchase of rice by the *Hospital de Todos os Santos* in Lisbon was expanded from 14 to 20 *quintais* each year (the *quintal* weighs about 58 kilos)[38]. The cookbooks of noble houses confirm the spread of rice in Portuguese cuisine in the 16th and 17th centuries. Rice appears in various recipes, such as the white *manjares* (delicacies) made with milk or served with lamb, chicken and fish[39]. In the 18th century, an observer said that rice «is present in all meals»[40]. Yet, eating rice is

[33] LINARES, Olga, «African rice (*Oryza glaberrima*): history and future potential», in *PNAS*, 99, 25, 2002, pp. 16360-16365; ID., «From tidal swamp to inland valley: on the social organization of wet rice cultivation among the Diola of Senegal», in *Journal of the International African Institute*, 51, 2/1981, pp. 557-595.
[34] BRAY, Francesca, *Introduction: Global Networks and New Histories of Rice*, in BRAY, Francesca, COCLANIS, Peter, FIELDS-BLACK, Edda, SCHÄFER, Dagmar (eds.), *op. cit.*, pp. 1-35. On 18th century rice plantations in the American continent: HAWTHORNE, Walter, *From Africa to Brazil*, cit., p. 148-155; CARNEY, Judith, *Black rice*, cit., pp. 30, 81-85.
[35] FERNANDES, Isabel Maria, «Alimentos e alimentação no Portugal Quinhentista», in *Revista de Guimarães*, 112, 2002, pp. 208-212.
[36] *Ibidem*, p. 136.
[37] RODRIGUES, Ana Maria (ed.), *Os negros em Portugal: séculos XV a XIX,* Lisboa, Comissão Nacional para as Comemorações dos Descobrimentos Portugueses, 1999, pp. 121-122; REGINALDO, Lucilene, «'África em Portugal': devoções, irmandades e escravidão no Reino de Portugal, século XVIII», in *História (São Paulo)*, 28, 1/2009, pp. 289-319. By *corregidores*, the complainants probably refer to minor officials of the Kingdom, magistrates or not, with administrative and judicial functions in a particular neighbourhood.
[38] *Alvará* of 7 January 1697, consulted at legislacaoregia.parlamento.pt. Measure units: LOPES, Luís Seabra, «Sistemas legais de medidas de peso e capacidade: do condado portucalense ao século XVI», in *Portugalia: Revista de Arqueologia da FLUP*, 24, 2003, pp. 113-164.
[39] FERNANDES, Isabel Maria, *op. cit.*, pp. 137-138 (paleographic studies suggest that the Cookbook of Infanta

not the same as growing rice. Indeed, one mid-17th century chronicler does not seem to be aware of rice cultivation, or did not consider it worth mentioning[41].

In the mid-16th century, upstream on the Tagus, rice was grown in the marshlands (or *paul,* plural *pauis*) of Asseca, Muge and Ota near Santarém. One percent of their annual harvest was delivered by the tenants to the hospital of Castanheira, as established by royal decree in 1546, which suggests significant production[42]. In 1562, another royal estate neighbouring the Muge marsh was rented for 30 years to plant rice and other cereals[43]. Moreover, a place within the aforementioned marsh of Asseca was registered as the *Paul do Arroz* (Rice Marsh) in 1509, which prompts Maria Beirante to suggest that rice had been grown there since at least the end of the 15th century[44]. The cultivation of rice in these wetlands of the Tagus, less than 80 km from Lisbon, indicates the existence of a production zone to feed the capital (see Figure 1). Brandão states in 1552 that significant quantities of rice enter the city each year, «by sea and overland»[45].

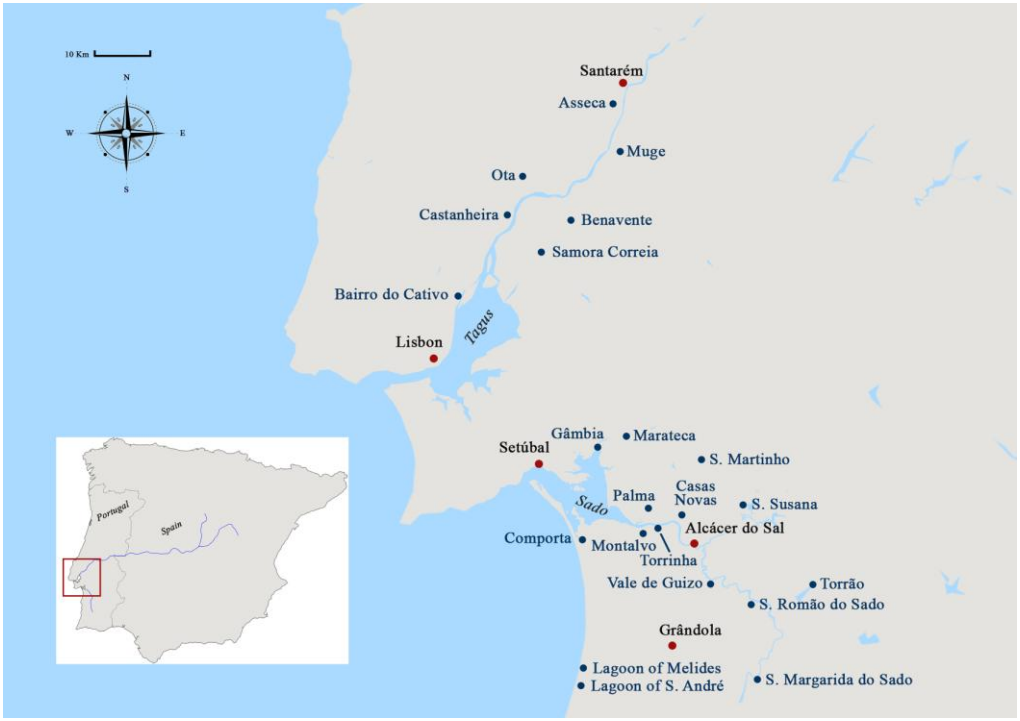

Figure 1. Map of Portugal and the Sado and Tejo rivers, identifying the places referred to in the text. The main cities are marked with a red dot. The map was prepared by Catarina Leal.

D. Maria of Portugal (1538-1577) is actually from the late 15th century); RODRIGUES, Domingos, *Arte de cozinha*, in BRAGA, Isabel Drumond (ed.), *Obras Pioneiras da Cultura Portuguesa, 21, Primeiro Tratado de Cozinha*, Lisboa, Círculo de Leitores, 2017, pp. 51-200 [ed. or.: Lisboa, Oficina de João Galrão, 1680].

[40] HAWTHORNE, Walter, *From Africa to Brazil*, cit., p. 149.

[41] In 1655, Severim de Faria mentions investments that improved the economies of European countries, such as rice cultivation «which today is so useful in Valencia», but does not mention it in Portugal (FARIA, Manuel Severim de, *op. cit.*, p. 17).

[42] ANTT, ref. PT/TT/GAV/15/2/16; GODINHO, Vitorino Magalhães, *op. cit.,* p. 392.

[43] d'AZEVEDO, Pedro A., *Sebastião de Macedo, o Moço*, in FREIRE, Anselmo Braamcamp, PESSANHA, José da Silva (eds.), *Archivo Historico Portuguez*, vol. I, Lisboa, s.e., 1903, pp. 371-380.

[44] BEIRANTE, Maria Rocha, *Santarém Quinhentista*, Lisboa, Livraria Portugal, 1981, p. 112.

[45] FERNANDES, Isabel Maria, *op. cit.*, p. 137.

Long before «Black rice» was a well-known thesis, Beirante showed that Santarém, on the Tagus margins, had close links to maritime expansion during the 15th and 16th centuries, and in particular with the Gulf of Guinea, and admits that although rice of Levantine origin has been known of for a long time, it was only «the variety coming from Guinea»[46] that became widespread. In fact, much of the rice arriving in Portugal from the late 15th century to the early 16th century was *O. glaberrima*, which was purchased on the West African coast by Portuguese settlers in Cape Verde who regularly sent it to Lisbon[47]. Rice shipments from Cape Verde to Brazil during the 16th and 17th centuries are also well documented[48], as well as from the coast of Guinea to South Carolina in the late 17th century in Portuguese slave ships[49].

These data point to *O. glaberrima* being sent and possibly cultivated in Portugal. The treasury accounts from the reign of Manuel I (1495-1521) show that both African and Asian rice were likely arriving at Portugal's ports. Cape Verde's accounts for 1491-1493 show that the treasury received a quarter of all «caravels that the inhabitants of the said island set up for Guinea», including predominantly enslaved people, gold and ivory, but also 142 *alqueires* of rice and corn (the *alqueire* is about 13-14 liters)[50]. The Fortress of Santiago in the city of Quiloa (in the southeastern coast of present-day Tanzania) declared 390 *alqueires* of rice in 1505-06[51].

Regarding cultivation on the margins of the Sado, the archives are silent until 1700. According to the authors from the 19th and 20th centuries, rice was a recent arrival in the region. Orlando Ribeiro says in 1945 that rice is «of very recent use, having become available only a century ago»[52]. Andrade Corvo, in 1860, argues that in most places rice cultivation is less than 30 years old and in some places was introduced in the second half of the 18th century[53]. However, Corvo's report ends up revealing rice's long history on the Sado. One cited physician from Alcácer do Sal declares that rice cultivation dates back to one hundred years ago, «or even before, to be more precise»[54]. In two nearby riverside rural parishes, Vale do Guizo and Palma, the beginning of the culture was dated back to 1700 and 1720, respectively, according to the information of the local

[46] BEIRANTE, Maria Rocha, *op. cit.*, p. 112. As early as 1965, the possibility of *O. glaberrima* being planted in Tagus was raised in GODINHO, Vitorino Magalhães, *op. cit.,* p. 392.
[47] HAWTHORNE, Walter, *From Africa to Brazil*, cit., p. 141; GODINHO, Vitorino Magalhães, *op. cit.,* pp. 391-392.
[48] GODINHO, Vitorino Magalhães, *op. cit.,* pp. 395; HAWTHORNE, Walter, *From Africa to Brazil*, cit., p. 141.
[49] CARNEY, Judith, *Out of Africa: Colonial rice history in the Black Atlantic*, in HARDING, Sandra (ed.), *The postcolonial science and technology studies reader*, Durham, Duke University Press, 2011, pp. 140-149, pp. 143-147.
[50] FREIRE, Anselmo Braamcamp, PESSANHA, José da Silva (eds.), *Archivo Historico Portuguez*, cit., vol. I, p. 95, paragraph 4. On the units: LOPES, Luís Seabra, «Sistemas legais de medidas», cit., pp. 113-164.
[51] FREIRE, Anselmo Braamcamp, PESSANHA, José da Silva (eds.), *Archivo Historico Portuguez*, cit., vol. I, p. 356, paragraph 97.
[52] RIBEIRO, Orlando, *Portugal, o Mediterrâneo e o Atlântico*, Coimbra, Coimbra Editora, 1945, p. 117.
[53] CORVO, João de Andrade, *op. cit.*, pp. 354, 369-407. This 550-page report was urged by a government decree aiming to assess the effects of rice cultivation on the proliferation of malaria.
[54] *Ibidem*, p. 257.

priests[55]. According to the aforementioned physician, there was an initial period when rice cultivation was reduced to small plots «grown by the inhabitants», and a second period from the 1830s where «a thousand men from outside were employed every year», reaching three thousand at the time of his writing. In the first period and «still by the second» the method of collecting rice was «imperfect» and «the milled processes quite ignored, so that [the rice] was very dirty and very broken, an inferior product which for a long time did not encourage the capitalists to employ in this industry the very large capital which is necessary for the good cultivation of rice and to relieve the rice fields of the invasion of the tides»[56].

In short, there were rice crops in the Tagus floodplains throughout the 16th century and from about one hundred years later they were also described as existing on the Sado. They were marginal crops, yet apparently persistent. What varieties of rice were these, and how were they cultivated? Is the description by the physician from Alcácer do Sal of an old-fashioned, small-scale culture, formed by the local inhabitants, the key to understanding why rice cultivation up to the 18th century has been overlooked historically?

3. Enslaved Black people in the Tagus and Sado fields from the 15th century

In 1444, a group of 235 people were abducted from the African coast and brought to Europe, arriving in Lagos, southern Portugal. This is considered a historical benchmark that marked a transition in the history of slavery: the beginning of the Atlantic slave trade[57]. The forced shipping of Black Africans to Portugal continued throughout the following centuries until the late 1700s. Didier Lahon estimates that more than 400,000 enslaved people entered Portugal[58]. Portugal was so immersed in the trade that «slaves [...] were employed in almost every sector of the economy»[59]. In the 16th century Évora, the majority of enslaved people were owned by the nobility, aristocracy, government and religious elites but also by professionals (lawyers, physicians), tradesmen (goldsmiths and shoemakers, among others) and farmers (land owners, cattle herders)[60]. As early as 1512, the crown made Lisbon the only authorised harbour for the

[55] *Ibidem*, p. 136.
[56] *Ibidem*, pp. 256-257.
[57] SAUNDERS, Alastair Corston de Custance M., *op. cit.,* pp. 35, 167.
[58] LAHON, Didier, «Eles vão, eles vêm. Escravos e libertos negros entre Lisboa e o Grão-Pará e Maranhão (séc. XVII-XIX)», in *Revista Estudos Amazônicos*, 6, 1/2011, pp. 70-99, p. 74.
[59] SAUNDERS, Alastair Corston de Custance M., *op. cit.*, pp. 27, 62.
[60] *Ibidem*, pp. 65-66.

importing of enslaved people, with exceptions made for Setubal, at the mouth of the Sado, and other harbours in Algarve[61].

The presence of enslaved Black people is relatively easy to trace from the mid-15th century onwards, which makes the scant attention paid to it by Portugal's historiography even more problematic[62]. The first references to Black people in Lisbon appear in 1444, in Évora in 1466, in Almada in 1468, in Setúbal in 1475, in Vale de Zebro in 1489, in Santarém in 1461, and in Muge in 1528[63]. In 1550, approximately 10% of Lisbon's population was Black, which in the 17th and 18th centuries may have reached 15%[64]. In 1535, one foreign observer visiting Évora stated that «in all places one could find black people»[65].

There is much evidence of a strong presence of enslaved and freed Black people on the Sado and the Tagus from the 15th century. In the 16th century, the proportion of baptisms of enslaved people in the regions that encompass the basins of the lower Sado and Tagus ranged from 5.8% to 7.8%. In 1570, the vicar of Santa Maria do Castelo in Alcácer do Sal, Sado, was called upon several times to marry «slaves» and «freedmen»[66].

Between 1665 and 1761, 46 boys and 60 girls were baptised whilst slaves in São Romão. Around the same period, there are references to 12 slave owners (owning 23 slaves) in this village on the Sado floodplains. Two of them were farmers (*lavradores*) and one was a priest. By the first half of the 18th century, there were 48 slave owners (seven women among them) including nine farmers, one foreman (*feitor*), two captains and two priests. The total number of enslaved people was 117: 49 children, 52 women and 16 men[67]. Finally, two slave owners were reported in Casa Branca and Porto Rei (São Romão) in 1801-1804, several decades after the first abolition laws in Portugal (1761 and 1773)[68].

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[61] *Ibidem*, p. 62.

[62] The work of SAUNDERS, Alastair Corston de Custance M., *op. cit.*, and of TINHORÃO, José Ramos, *op. cit.*, represents the first meaningful attempts to uncover this history. Other works also highlighted the agency of enslaved Blacks in Portugal with regard to festivities, literature, music, religion, theatre, language, resistance, riots, escapes, and religious brotherhoods: FONSECA, Jorge, *Escravos no Sul de Portugal*, cit.; FONSECA, Jorge, *Religião e liberdade: Os negros nas irmandades e confrarias portuguesas (século XV a XIX)*, Lisboa, Edições Húmus, 2016; LAHON, Didier, «Da redução da alteridade a consagração da diferença: As irmandades negras em Portugal (séculos XVI-XVIII)», in *Projeto História*, 11, 2012, pp. 53-83; LAHON, Didier, «Eles vão, eles vêm», cit.; REGINALDO, Lucilene, *op. cit.*; SWEET, James H., *Recreating Africa: culture, kinship, and religion in the African-Portuguese world, 1441-1770*, Chapel Hill, Univ of North Carolina Press, 2003; HENRIQUES, Isabel Castro, *Os africanos em Portugal: história e memória (séculos XV-XXI)*, Lisboa, Comité Português do Projecto Unesco A Rota do Escravo, 2011; ALCÂNTARA, Ana, ROLDÃO, Cristina, CRUZ, Carlos, *op. cit.*

[63] SAUNDERS, Alastair Corston de Custance M., *op. cit.*, p. 51; TINHORÃO, José Ramos, *op. cit.*, p. 458.

[64] LAHON, Didier, «O escravo africano na vida económica», cit., pp. 73-80.

[65] STELLA, Alessandro, *Ser esclavo y negro en Andalucía Occidental (siglos XVII y XVIII). Documentos de Archivo*, Madrid, Fundación Ignacio Larramendi, 2011, p. 8.

[66] SAUNDERS, Alastair Corston de Custance M., *op. cit.*, pp. 50-61.

[67] NETO, Maria Cristina, «A escravatura em S. Romão do Sado», in *Memórias do Instituto de Malariologia de Águas de Moura*, Palmela, Instituto Nacional de Saúde Dr. Ricardo Jorge, 2001, pp. 65-71.

[68] NETO, Maria Cristina, *Escravos em São Romão do Sado após a lei abolicionista de Pombal*, in *Congresso sobre o Alentejo Semeando Novos Rumos*, Évora, Associação dos Municípios do Distrito de Beja, 1985, pp. 1235-1238.

As early as the late 15th century, Black Catholic brotherhoods were being formed in Portugal, playing an important role in protecting and purchasing the freedom of their enslaved brothers, occasionally against the will of the owners[69]. Most of these brotherhoods worshiped *Nossa Senhora do Rosário,* or Our Lady of the Rosary[70]. The *Memórias Paroquiais* (parish surveys conducted across the country) of 1758 show that all of the parishes of Alcácer do Sal, in addition to all the parishes along the river Sado and its tributaries between Alcácer and the village of Alvalade, 80 km upstream, worshiped Our Lady of the Rosary at a shrine in the parish church. Six of these ten parishes also had a brotherhood dedicated to that sect[71]. We cannot assert that all the brothers of the Rosary were Black or *pardo* (in reference to mixed black/white ancestry), but the coincidence was high in the southern country[72]. Indeed, there are a remarkable number of references to brotherhoods of Black Men (*Homens Pretos*) in the Sado region between the 16th and 18th centuries. There were at least three in the city of Setúbal and four in Alcácer do Sal (in the town and in parishes of Palma, Santa Susana, and S. Martinho), though nowhere else in the rest of the country, apart from Lisbon and Porto. In 1552, the brotherhood of Alcácer had 827 confreres. Four more appeared in the area of Sado: Marateca (1661), Torrão (1594-1604), Messejana (1652-1722-1747), and Garvão (1766), the last two in the Upper Sado[73]. In Santa Susana, the brotherhood was created at a later date, in 1796. With regard to the Tagus villages, three brotherhoods were identified in Samora Correia, Benavente and Muge[74].

To uncover the role of these displaced populations in the development of swamp rice cultivation, the connections between their origins, destinations and labour must be attended. Many enslaved people arriving in Portugal were from Upper Guinea coastal areas, where mangrove rice farming had already been developed. During the 15th-16th centuries, slavers preferred people from the Senegambia, a region encompassing modern Senegal, Gambia and

[69] It is not easy to know the number of free Black people, since the estimates are based mainly on records of baptisms and legal entries in Portugal of enslaved people. Apparently, free Blacks were an important part of the afro-descendants population in Lisbon, where in the 16th century emerged the first known Black people's neighbourhood: the Mocambo. This place was recognized by a royal decree as one of the six neighbourhoods of the city and was officially named with a Bantu language word. It was a place where free Blacks lived but also enslaved ones. See: HENRIQUES, Isabel Castro, LEITE, Pedro Perreira, *Lisboa, cidade Africana. Percursos de Lugares de Memória da Presença Africana. Séculos XV-XXI*, Lisboa/Ilha de Moçambique, Marca d'Água, 2013.

[70] FONSECA, Jorge, *Religião e liberdade,* cit., pp. 7-132.

[71] Santa Maria do Castelo (Alcácer, with brotherhood), Vale de Guizo (brotherhood), Montevil, Palma (brotherhood), Santa Susana (brotherhood), São Martinho (brotherhood), São Romão do Sado, Sítimos (brotherhood), Santa Margarida do Sado, Alvalade (brotherhood). See: CAPELA, José Viriato, MATOS, Henrique, CASTRO, Sandra (eds.), *As freguesias dos distritos de Lisboa e Setúbal nas Memórias Paroquiais de 1758. Memórias, história e património,* Colecção Portugal nas Memórias Paroquiais de 1758, vol. 9, Braga, Universidade do Minho, 2016, pp. 585-722.

[72] FONSECA, Jorge, *Religião e liberdade,* cit., pp. 23-63.

[73] *Ibidem*, pp. 38-59; REGINALDO, Lucilene, *op. cit.*, pp. 289-319.

[74] FONSECA, Jorge, *Religião e liberdade,* cit., p. 39.

Guinea-Bissau[75]. In the first half of the 16th century, around 2,000 enslaved people arrived in Lisbon from this region yearly, although many were subsequently transported out of the country again[76]. In the last years of the slave trade to Portugal from 1756-1763, records by the Casa da Índia in Lisbon indicate that 267 slaves (27% of the total) were brought from Cacheu[77], a port in modern Guinea-Bissau, which is historically connected to both mangrove rice farming[78] and the slave trade[79]. In addition, three unsuccessful boat escapes from Setúbal and Lisbon resulted in the incrimination of five Wolof slaves from Senegambia in the 1554-1565 period[80]. In São Romão in Sado, the baptism books from 1665 to 1761 list the origins of only three women, all mothers: Lisbon, Wolof and Angola[81].

Furthermore, enslaved people from these regions were considered important for extending the workforce in the fields and on the waterways[82]. Having arrived in Portugal, they were driven, among other tasks, into farming and husbandry in rural areas, particularly after 1470[83]. According to José Tinhorão[84], enslaved labour was established in rural areas from the mid-15th until the late-17th centuries, and declined during the 18th century. For the particular context of coastal and riverine agricultural work, people coming from the Guinea Coast were regarded as important to «clear land and drain marshes» by the Courts of 1472-73, which petitioned for an export ban on enslaved people arriving from this region. The king refused, but ordered that all enslaved people from Guinea would come to Portugal before being shipped abroad again[85].

Finally, toponymy is another resource that highlights the continuity of Black people's presence, particularly in areas located by the marshes. On the northern banks of the Sado estuary, not far from Setúbal, *Vila do Negro* (Black Man's Village) is marked on an agricultural map from the late 19th century (Figure 2). The village is surrounded by salt pans and juxtaposed rice fields that extend up the Marateca stream. Less than two kilometers away is *Quinta da Gâmbia* (Gambia Farm), also on the estuary margins, which retains this toponymy nowadays. Elsewhere in lower

[75] SAUNDERS, Alastair Corston de Custance M., *op. cit.*, p. 7.
[76] *Ibidem*, pp. 21-25, 33.
[77] LAHON, Didier, «O escravo africano», cit., p. 77. The archives of the Casa da Índia, where the enslaved people who legally entered and lived in Portugal are supposed to have been registered, were destroyed by the Lisbon earthquake of 1755. The institution returned to function in 1756 and was extinct in 1823. On 12 February 1761, slavery was partially abolished in mainland Portugal. See SILVA, Filipa Ribeiro, «O tráfico de escravos para o Portugal setecentista: uma visão a partir do 'Despacho dos negros da Índia, de Cacheo e de Angola' na Casa da Índia de Lisboa», in *Sæculum – Revista de História*, 29, 2013, pp. 47-73.
[78] DAVIDSON, Joanna, *Sacred Rice: An Ethnography of Identity, Environment, and Development in Rural West Africa*, Oxford, Oxford University Press, 2016.
[79] LAHON, Didier, «O escravo africano», cit., pp. 74-77.
[80] SWEET, James H., *op. cit.,* pp. 89-91.
[81] NETO, Maria Cristina, «A escravatura em S. Romão», cit., p. 67.
[82] SAUNDERS, Alastair Corston de Custance M., *op. cit.*, p. 62.
[83] FONSECA, Jorge, *Escravos no Sul de Portugal*, cit., pp. 37, 77-81; CALDEIRA, Arlindo Manuel, *Escravos em Portugal: Das origens ao século XIX*, Lisboa, A Esfera dos Livros, 2017, p. 157.
[84] TINHORÃO, José Ramos, *op. cit.*, p. 96.
[85] SAUNDERS, Alastair Corston de Custance M., *op. cit.*, p. 28.

Sado, we found places called *Mulatos, Sesmaria dos Pretos* (Black People's Sesmarias), and *Fonte dos Negros*[86] (Black People's Fountain). By the Tagus estuary, in Santa Iria de Azoia, close to the riverside, there is the Neighbourhood of the Captive (*Bairro do Cativo)*.

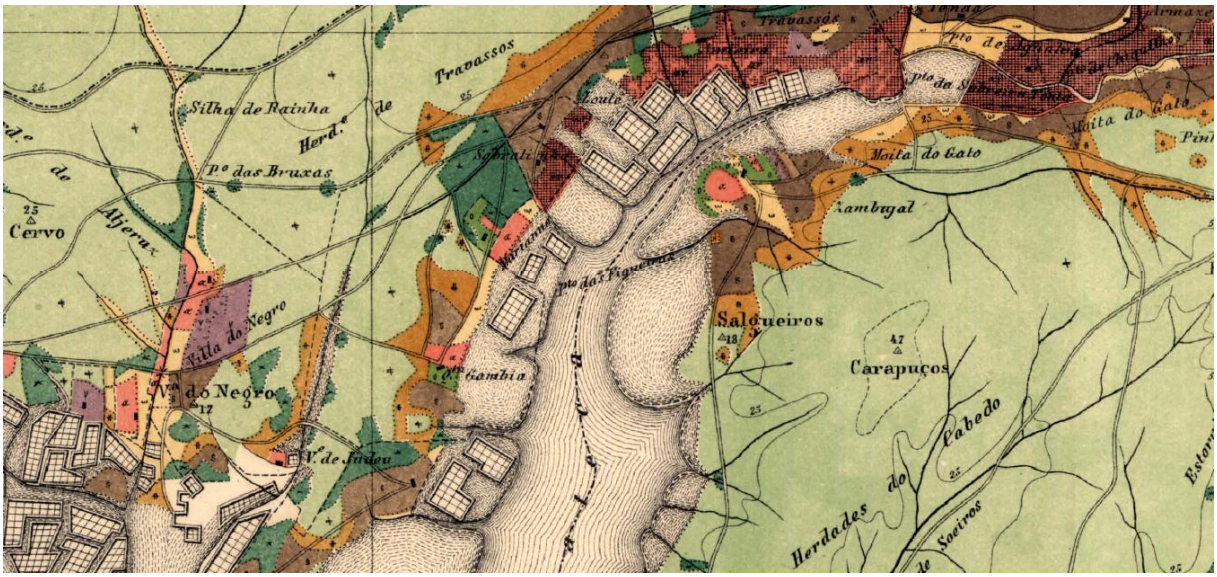

Figure 2. Detail of the Agricultural Chart nº 159 of Gerardo Pery (scale 1/50,000) (period 1887-1890). The salt pans are represented by rectangular shapes on a white grid and the rice fields by a narrow grid on a pink background (the rainfed cereals are pink without the grid). The remaining colorations along the margins of the estuary are vineyards, pastures and various orchards: fig, almond, carob, citrus and olive. The location of this area in the Sado estuary can be seen in Figure 1 at the place called Gambia.

4. Agroecological transformations in the marshes of the Sado and Tagus rivers

Salt marshlands (the *sapal,* plural *sapais*) are ever-changing hybrid environments, constantly indefinite and cyclic, shaped by seawater and freshwater flooding and specific to estuarine landscapes or riverine lowlands. The transformation of these environments for salt extraction, rice production or other agricultural activities required intense manual labour and specific knowledge and techniques, any analysis of which cannot ignore the presence of enslaved West Africans on the margins of the Sado and the Tagus. The process of converting salt marshes or former salt pans to agricultural land depends primarily on the mastery of desalination procedures. In the case of conversion into rice fields, particular knowledge about rice varieties, topography, soil types and mobilization, weather and tides patterns, salt- and freshwater dynamics is required. A network of dams must be built – to intercept the tides and hinder the

[86] NETO, Maria Cristina, «A escravatura em S. Romão», cit., p. 65.

circulation of salt water – and integrated within a system of communicating ditches that ensures the management of both fresh and salt water.

The existence of these technologies was well documented in relation to West African estuaries and coastal rivers[87], where mangrove rice cultivation was mentioned in the first European descriptions of the region[88]. Rice cultivation in these environments is distinct from that adopted in upland and freshwater farming. Therefore, a set of techniques specific to the brackish waters of the marshlands would have either been imported or newly developed in Portugal. Nowadays, in Guinea-Bissau, the conversion of mangroves into rice fields usually demands the construction of a main dam and several drainage canals to the estuary that allow the selective blocking of seawater, the drainage of freshwater and the initial desalination processes. Inner ditches and dams are relevant to adjust the distribution of water and ensure an effective drainage of water excess. Still, particular features of coastal and riverine landscapes demand for site-specific technological arrangements for adjusting the water level, ensuring soil fertility, and weed management, among other measures. This implies that local expert farmers are consulted in different villages to find the most adequate techniques that are able to respond to different coastal features, challenging weather conditions and stronger tides[89].

Similarly, the saline gradient along the rivers Sado and Tagus, the crop varieties to be cultivated, the availability of freshwater, as well as the vegetation and soil types, have probably demanded site-specific technological transformations, for adequate salt extraction, the cultivation of freshwater or tidal rice, or other crops, at different segments of the estuary and river.

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[87] RICHARDS, Paul, *Culture and community in the selection and maintenance of African rice*, in BRUSH, Stephen B., STABINSKY, Doreen (Eds.), *Valuing Local Knowledge: Indigenous People and Intellectual Property Rights*, Washington, D.C., Island Press, 1996, pp. 209-229; FIELDS-BLACK, Edda, *Deep Roots*, cit.; TEMUDO, Marina Padrão, «Planting Knowledge, Harvesting Agro-Biodiversity: A Case Study of Southern Guinea-Bissau Rice Farming», in *Human Ecology*, 39, 3/2011, pp. 309-321; LINARES, Olga, «From tidal swamp to inland valley», cit., pp. 557-595.

[88] ZURARA, Gomes Eanes, *Chronica do descobrimento e conquista de Guiné*, Paris, Off. Typographica de Fain e Thunot, 1841 [manuscript date: 1453]; PEREIRA, Duarte Pacheco, *Esmeraldo de situ orbis,* in PELÚCIA, Alexandra, COSTA, João Paulo Oliveira (eds.), *Obras pioneiras da cultura portuguesa*, *Primeiros escritos de geografia e ecologia*, vol. 6, Lisboa, Círculo de Leitores, 2018, pp. 67-240 [manuscript date: 1506]; ALMADA, André Alvares de, *Tratado breve dos Rios de Guiné do Cabo Verde*, Porto, Typographia Commercial Portuense, 1841, p. 36 [manuscript date: 1594]: «Winter begins in these parts at the end of April, beginning of May onwards. The black people make the fields of rice in those *lalas*, and make ditches of earth to prevent the river from entering there, but even so the river often breaks the ditches and floods the fields. After this rice is born, it is transferred to other drier *lalas*, where it quickly provides food.»

[89] LUZ, Ana Luísa, DABO, Ansomane, SOUSA, Joana, DABO, Sene, ZAUAD, Zaino, *Maboan: Notas sobre a construção de um dique,* Chão-de-Gente - Cabasane Biteraune, Portugal - Guinea-Bissau, 2015, 25'; SOUSA, Joana, LUZ, Ana Luísa, «"The tides rhyme with the moon": The impacts of knowledge transmission and strong spring tides on rice farming in Guinea-Bissau», in *Human Ecology*, 46, 2/2018, pp. 147-157; TEMUDO, Marina Padrão, *Inovação e Mudança em Sociedades Rurais Africanas: Gestão dos Recursos Naturais, Saber Local e Instituições de Desenvolvimento Induzido*, *PhD Dissertation in Agronomy*, Lisboa, Instituto Superior de Agronomia, 1998.

The documentation suggests a first period of cultivation in freshwater marshes (the *pauis*) close to the Tagus, which were drained with ditches for the cultivation of cereals, including rice. At some point, the lower lands of these marshes, regularly flooded by the Tagus tides, were also cultivated after the construction of dikes and floodgates, which allowed freshwater to drain while blocking the rise of the salty river. The Ota, Asseca and Muge marshes seem to have been subject to several investment and innovation cycles interspersed by abandonment[90]. In 1562, a wetland in the marsh of Muge was rented after being abandoned for about 20 years. The drainage system was ruined, and the land served as a refuge for wild boar and deer that were damaging the neighbouring floodplain crops[91]. An 18th century engineer (in 1790), reports the degradation of the hydraulic infrastructure of Ota and Asseca, convincingly underlining its age. He describes that «Ota was closed with a *cataracta*, or sluice [...] acting against the flux of the tides. This sluice, called an *Adufa*, still exists, is 19 palms wide, and of a moderate thickness». The sluice underwent numerous transformations until the 1790 version, in which the work of servants is unnecessary, as it offers drainage to the interior water and would close on its own at the first effects of the high tides, in a way that «the ditches do not receive any other water except that coming from above»[92].

In any case, between these innovations, which «defended» agricultural soils in freshwater retention basins from «enemy tides», and cultivation in the estuarine marshlands covered in mud and halophyte plants, there are considerable differences. In the second half of the 18th century, rice was already cultivated on the south bank of the Sado estuary: Casas Novas (1756), Montalvo (1786), and Torrinha (1788)[93]. And it is possible that rice cultivation in the early 1700s on the Palma and Vale de Guizo streams, both in areas still under the influence of saline tides[94], represents early innovation[95]. However, little is known about how and when rice spread to the salt swamps. «Most of the lands that are today [1860] rice paddies were marshes of mixed salt- and freshwater from the river, or of freshwater from springs and rains only»[96]. In 1860, our physician from Alcácer explained that the estuary rice fields were «stolen from the tides» through an extensive network of earth dikes (*marachões*, *muros*, and *cômoros*) that intersect salt water. These

[90] CABRAL, Estevão, *Memoria sobre os damnos causados pelo Téjo nas suas ribanceiras* and *Sobre o Paul de Otta, suas causas, e seu remédio*, in *Memorias economicas da Academia Real das Sciencias de Lisboa,* t. II, Lisboa, Academia Real das Sciencias, 1790, pp. 144-196; RIBEIRO, Carlos, *Descripção do terreno quaternário das bacias dos rios Tejo e Sado*, Lisboa, Academia Real das Sciencias, 1866; BAETA-NEVES, Carlos Manuel, «Da história do Paul da Ota e a defesa das zonas húmidas», in *Anais do Instituto Superior de Agronomia*, 37, 1977, pp. 257-274; d'AZEVEDO, Pedro A., *op. cit.*, pp. 371-380.
[91] d'AZEVEDO, Pedro A., *op. cit.*, pp. 371-380.
[92] CABRAL, Estevão, *Memoria sobre os damnos causados pelo Téjo nas suas ribanceiras* and *Sobre o Paul de Otta, suas causas, e seu remédio*, cit., pp. 148-150.
[93] CORVO, João de Andrade, *op. cit.*, p. 136.
[94] COUTINHO, Maria Teresa, *Comunidade fitoplanctônica do estuário do Sado. Estrutura, dinâmica e aspectos ecológicos*, Lisboa, IPIMAR, 2003, p. 101; CAPELA, José Viriato, MATOS, Henrique, CASTRO, Sandra (eds.), *op. cit.*, pp. 591, 593, 720.
[95] CORVO, João de Andrade, *op. cit.*, p. 136.
[96] *Ibidem*, p. 255.

lands were then levelled on a regular surface, and as they are below the level of the high tide, the soil needs to be permanently «sweetened» with freshwater to counteract the entry of salt[97].

The description of the rice cultivation system in Comporta (1808-1812) sheds some light on how the cultivation of rice in drained *pauis* would have advanced into the *sapal*. It also shows a technological link between the Tagus and the Sado. In 1812 major works began at the *paul* of Comporta, which flows into the Sado estuary. The goal was to rehabilitate the system of ditches and floodgates and recover the «old» and profitable rice culture. The farm was neglected after 1808, the ditches were clogged, the floodgates damaged and the soil flooded all year with «rotten» water. Furthermore, the drainage system had not been well planned («it has an error») because the floodgates were «higher than the bottom of the ditches». Therefore, masonry pipes were to be placed three palms below each floodgate to ensure full soil drainage. As soon as the work was finished and the first rice income obtained, the plan was to proceed to the salt marsh that was attached to the *paul*, «putting freshwater in it» and thus obtaining another ¼ of a league of crops and pastures. José António, who led the works, was called due to his experience in Muge, where he managed the floodplains of the former foreman of Comporta, which seems to suggest that the circulation of knowledge about swamp rice plantations was not very common[98].

The arrival and settlement of enslaved people from the mangrove enclaves of rice farming and salt extraction in West Africa, close to the marshes of river basins, may have been convenient for the development of agriculture in the marshes and riverbanks of the Tagus and the Sado. In fact, the technical problems and solutions referred to above are significantly common in West Africa, namely, the challenges of managing an arrangement of connected vessels, dams and drainage canals to control the freshwater and brackish water in ways conducive to agriculture.

5. The 18th century and beyond: major changes

Between 1750 and 1850 there was a clear expansion of rice crops throughout the country, including in the regions north of the Tagus (e.g. the rivers Lis and Mondego, and the Aveiro estuary). In Alcácer do Sal, in addition to the five locations where rice appears in the 1700s, many others were reported in the first half of the 1800s: in the 1800s-1810s rice crops appeared in 18 places, in the 1820s in 1, in the 1830s in 4, in the 1840s in 25, and in the 1850s in 6[99]. In the mid-19th century, rice was cultivated all along the Sado.

[97] *Ibidem*, p. 260.
[98] ANTT, ref. PT/TT/CSRN/C-A/3/241 (docs. 2-85).
[99] CORVO, João de Andrade, *op. cit.*, pp. 11-60, 136, 221-324. This report shows a gradual increase in locations identified with cultivated rice, although it may constitute a 1860's skewed picture.

In 1758 rice was grown in Palma, in a stream that flows into the estuary near Alcácer[100]. Next to Vale de Guizo, there is a mill built in around 1780, adapted to rice husking[101]. These locations seem to represent the two centers of rice's origins on the Sado. In 1800, rice cultivation was controversial enough to justify a scientific *Memória* (essay) about the relationship between rice paddies and malaria in Portugal[102]. Félix Brotero wrote in the *Flora Lusitanica* of 1804 that rice was grown near Montemor-o-Velho (lowlands of the Mondego River) and south of the Tagus in Sines, Grândola, Comporta, and other unidentified locations (*et alibi*)[103]. By Sines and Grândola, he probably refers to the coastal lagoons of Santo André and Melides (where in 1860 rice is said to have begun in 1810) or to the inner parishes of Grândola that border the river Sado (in 1850s all of the coastal or riverside parishes of Grândola grew rice)[104].

This development apparently took place as a side effect of the policies designed to foster Brazilian production, which lasted from 1756 to at least 1826. For about 70 years, rice from Brazil was exempt from customs duties, and a «prohibition» on «foreign rice» (mainly rice from South Carolina carried by English merchants) was added in 1781[105]. In 1816, the customs mechanism drafted from 1781 was enshrined in law: foreign rice (or carried by ships without the Portuguese flag) could not enter Portugal unless Brazilian rice (and therefore also the rice produced in Portugal) reached the price of 4,800 *reais* per *quintal* in Lisbon. When this value was reached, foreign rice could be landed, incurring the respective customs fees[106]. In 1772, Lisbon officials from the Company of Grão Pará and Maranhão said that the Portuguese consume more than 8,000 tons of rice each year[107].

At the end of the 19th century, a known ethnographer visits the Sado region and writes about the afro-descendants living there. According to him, «It seems that it was the Marquis of Pombal who tried to acclimatize this race in the malarial lands of Sado»[108]. This story of a second wave of African migrants to the Sado region, and their supposed greater resistance to malaria, has

[100] CAPELA, José Viriato, MATOS, Henrique, CASTRO, Sandra (eds.), *op. cit.*, p. 593.
[101] QUINTELA, António Carvalho, MASCARENHAS, José Manuel, CARDOSO, João Luís, ÁLVARES, Maria Teresa, PINA, Telmo, *Património cultural dos cursos de água da bacia do Sado*, in MOREIRA, Ilídio et al. (eds.), *Gestão ambiental dos sistemas fluviais*, Lisboa, ISApress, 2004, pp. 345-374. Rice was husked using horizontal millstones with a cork board in the middle, which allowed both milling cereals and husking rice. The driving force was water from a stream 6 km away.
[102] TELLES, Vicente Seabra Silva, *Memoria sobre a cultura do arros em Portugal*. Lisboa, Casa Litteraria do Arco do Cego, 1800.
[103] Cited by SILVA, Manuel Vianna e, *op. cit.*, p. 9.
[104] CORVO, João de Andrade, *op. cit.*, pp. 123, 128-131.
[105] Series of royal decrees and public notices: Decree of July 1, 1761, *Alvará* of October 8, 1766, Decree of May 18, 1773, *Alvará* of July 24, 1781, Decree of August 1, 1783, Decree of March 16, 1804, Decree of May 2, 1815, Notice of June 20, 1817, Notice of January 26, 1824, Law of December 23, 1826. Also, *Instituição da Companhia Geral do Grão Pará e Maranhão*, Lisboa, Officina de Miguel Rodrigues, 1755.
[106] Notice of June 20, 1817, Decree of May 2, 1815, Notice of January 26, 1824.
[107] HAWTHORNE, Walter, *From Africa to Brazil*, cit., p. 148.
[108] VASCONCELOS, José Leite de, «Excursão archeologica a Alcacer-do-Sal», in *O Archeologo Português*, 1, 3/1895, pp. 5-92, p. 67.

persisted ever since, and always without historical sources[109]. Perhaps the ethnographer was recording an older oral tradition that seems to linger in the region[110]. Historical fact or not (the Pombaline archives are silent about it), it is a powerful image (a 20th century agronomist details that Pombal promoted «an experimenting colonization, with Black people in Santa Margarida do Sado village»[111]) that seems to derive from concrete developments in the second half of the 18th century.

Firstly, labour shortage became a major concern after the first abolitionist laws were introduced (1761, 1773)[112]. According to Pina Manique, Secretary General of the Police, three thousand families arrived from the Azores islands from 1777 and were divided among the counties of the Alentejo. In 1797, Manique forbade the sale of enslaved people outside of Portugal, due to the «lack of manpower» in agriculture and in Lisbon. Only «Galicians» were employed, but were «in short supply and I do not know how to make up the workforce». In Sado, near Setúbal, a Black Catholic brotherhood sought to use the law of 1773 (in a court case dating 1777-1781) to free a dozen, third generation slaves, but the claim was rejected because «in the Alentejo, slaves [...] are necessary for the cultivation of land»[113].

Meanwhile, the people of the wetlands were thought to have evolved to be better adapted to climates considered otherwise unhealthy. In 1778, the Overseas Council proposed that outlaws and couples «living idle» in the kingdom should be sent to Cape Verde to repopulate it, in return for land, seeds, and farming tools. These people, «should be from among the natives of Villa de Moura, Gollegã [in the Tagus], Ribeira do Sado, Comporta and other lands with a climate similar to that of these islands»[114]. The Alcácer physician (1860) seems to confirm this connection when voicing, in reference to the endemism of malaria, that «tradition has given this land the name the African Coast»[115]. Finally, in the 18th century, a brotherhood of Blacks in Setúbal venerated Saint

[109] ALMEIDA, Manuel Gaio, *Mulatos no Concelho de Alcácer. Subsídios para a definição étnica das gentes do Vale do Sado*, Lisboa, s.n., 1956; CABRAL, Amílcar Lopes, *op. cit.*, p. 116; NETO, Maria Cristina, «A população escrava entre 1603 e 1632 na freguesia de Santa Maria do Castelo (Alcácer do Sal) através dos livros de baptismo», in *Actas do 4. º Congresso do Algarve*, pp. 213-219, p. 219; CALDAS, Eugénio Castro, *A agricultura na história de Portugal*, Lisboa, Empresa de Publicações Nacionais, 1998, pp. 237-238; TINHORÃO, José Ramos, *op. cit.*, p. 225; FAUSTINO, Vítor, *Controlo populacional e erradicação da malária: o caso dos ranchos migratórios*, in BASTOS, Cristiana, BARRETO, Renilda, *A circulação do conhecimento: medicina, redes e impérios*, Lisboa, ICS Imprensa de Ciências Sociais, 2012, pp. 365-383, p. 369.
[110] MATOS, Maria Joaquina Caeiro, *As décimas da Ribeira do Sado. Processo aculturativo de uma forma poética no decurso do séc. XX*, Msc. Dissertation, Lisboa, Faculdade de Ciências Sociais e Humanas da Universidade Nova de Lisboa, 1998, pp. 28-33; NETO, Maria Cristina, «A população escrava», cit., p. 219.
[111] CALDAS, Eugénio Castro, *op. cit.*, p. 238.
[112] LAHON, Didier, «O escravo africano na vida económica», cit., pp. 73-100; LAHON, Didier, «Eles vão, eles vêm», cit., pp. 70-99; TINHORÃO, José Ramos, *op. cit.*, pp. 112-114.
[113] LAHON, Didier, «O escravo africano na vida económica», cit., pp. 95-97.
[114] BARCELLOS, José de Sena, *Subsídios para a História da Guiné e Cabo-Verde. Parte III*, Lisboa, Academia Real das Ciências de Lisboa, 1905, p. 83.
[115] CORVO, João de Andrade, *op. cit.*, p. 257.

Benedito of Palermo, whose image as a Black saint was highly revered by the women of Setúbal who brought him countless offers, trusting in his power against the evil fevers[116].

Across this network of events and popular beliefs, a medical, geographic, and economic discourse was developed about the greater resistance of Black people to malaria, which was well established by 1860: «the work on rice fields in America is carried out by the Black race, which, according to the numerous statistics of the auxiliary troops of the English army, is very little subject to malarial fevers»[117]. With the ban on the entry of new slaves into Portugal (1761) and the progressive reduction of this labour force (reinforced in 1773), the proletarianization of the free Black people through scientific racialization takes shape. According to Lahon, there was a significant entry of free Africans into Portugal in the first decades of the 19th century to fill the roles formerly undertaken by enslaved people[118]. The links between rice production, medical development, labour regimentation, and social division were well established by Mónica Saavedra from the late 19th century onward[119], which seems to have a direct precedent in the late 18th century shortage of enslaved workers.

6. Conclusions: co-production under slavery and proletarization

The folksongs of Alcácer do Sal, transcribed at the onset of the 20th century, are implicit oral memories of the realities mentioned above. In the words of their contemporary editors, they «were sung by our grandparents in daily activities and during their work in the fields»[120]:

O Senhor dos Martyres, Lá nos olivaes,
Senhora Sant'Anna... No meio dos sapaes!
Tem seu lindo altar, Bem feito á romana!
No meio dos sapaes... Senhora a Sant'Anna!

O senhor dos Martyres, Lá da Carvalheira,
É o pae dos pretos, D´aquela ribeira.
S´nhor João da Costa, Quem lh´o diz sou eu!...
Se elle é pae dos pretos... Também elle é seu.

Lord of the Martyrs, There in the olive orchards,
Lady Saint Anne... In the middle of the marshlands!
Has her beautiful altar, Well-built roman style!
In the middle of the marshlands... Lady, the Saint Anne!

Lord of the Martyrs, Of Carvalheira
He is the father of the Blacks, Of that river.
Lord João da Costa, I am the one telling you!....
If he is the father of the Blacks... He is also yours[121].

[116] FONSECA, Jorge, *Religião e liberdade*, cit., p. 41.
[117] CORVO, João de Andrade, *op. cit.*, p. 491.
[118] LAHON, Didier, «O escravo africano na vida económica», cit., p. 96; The Count of Óbidos reports to the German traveler Link, when they met at his farmstead in Palma (1797-99), the lack of people in agriculture and the need to «get back from the colonies the [black] crowd that those once had stolen». LINK, Heinrich Friedrich, *Notas de uma viagem a Portugal e através de França e Espanha*, Lisboa, BN, 2005, p. 250.
[119] SAAVEDRA, Mónica, «Malária, mosquitos e ruralidade no Portugal do século XX», in *Etnográfica. Revista do Centro em Rede de Investigação em Antropologia*, 17, 1/2013, pp. 51-76; ID., *Mosquitos envenenados: os arrozais e a malária em Portugal*, in BASTOS, Cristiana, BARRETO, Renilda, *A circulação do conhecimento: medicina, redes e impérios*, Lisboa, ICS, Imprensa de Ciências Sociais, 2012, pp. 351-364.
[120] VICENTE, Isabel Cristina, CARVALHO, António Rafael, *O Cancioneiro do Sado: Cantigas de raiz popular da região de Alcácer do Sal, publicada no Jornal Pedro Nunes*, Alcácer do Sal, Câmara Municipal de Alcácer do Sal, 2009, p. 4.

Folksongs are probably one of the few means to access the voices of enslaved people and their descendants who have settled in these rivers. In the songs above, while two patrons are evoked, the singer is reminding João da Costa, probably a landlord, that Jesus, the Lord of the Martyrs, Father of the Black workers, is also his Father. He may also be saying, mischievously, that João da Costa himself is not as white as he might think. Both Saint Anne, patroness of the marshes, and the Lord of the Martyrs, patron of the Black people living by the river, are part of a popular cosmology that brings together Black people, marshes and agricultural work in the Sado margins.

This paper presents a research hypothesis that we think is worth taking into consideration for more in-depth research. We have sustained connections between the presence, social life, knowledge and labour of Black enslaved people and the development of agriculture in wetlands, particularly of rice cultivation in the Sado and Tagus Rivers. Often subjected to the worst living conditions, these people essentially participated in the production of these places, specifically in their cultural, ecological and economic development.

Although it is not yet possible to know the extent of this contribution, the documentation and analogies found reinforce the perception that mangrove rice knowledge was incorporated into the cultivation of salt marshes in Portugal. In particular, the decisive technological arrangements that allow for water management in marshland environments and the experience (direct or received from their ancestors) in these technologies of many of those who worked on the margins of the Tagus and the Sado is a research path that deserves attention.

Recognising the place of the enslaved person in the production of technological and agricultural landscapes is relevant to discussions about co-production under conditions of exploitation. Refusing to look carefully at this possibility means that the production of history will blindly reproduce the colonial nature-society divide that naturalised *slaves* by dismissing any agency beyond their metabolic labour. Acknowledging their role as sources of technological skills and knowledge is an important starting point to open new research paths while decolonising history.

It will not be easy to find written sources that explicitly name enslaved people's skills and knowledge. The Black people of Tagus and Sado remain reduced to an organic functionalism, as if historiographical silence legitimised their absence in the history of these rivers. Transdisciplinary use of scarce sources that crosscut environmental and historical research approaches could deepen both the slavery and rice debate and expand it to southernwestern Europe. The history we are looking for might have only been registered by the transitional and marginal socioenvironments of the salt marshes. To pursue these endeavors, and based on others studies

[121] *Ibidem*, pp. 61, 71 (our translation).

on rice cultivation in the trans-Atlantic contexts, we advance that archaeological (hydraulic systems, agricultural tools, etc.), archaeobotanical (rice seeds, ancient substrates, etc.), or geophysical (surface or subsoil landscape patterns) surveys could shed light on rice cultivation during the 15-18th centuries and help pose new questions about as yet unexplored documentation.

Exploring methods to recover the role of African enslaved workers in the early-modern adoption of salt-marsh rice cultivation in two of Portugal's main estuaries is a regional contribution to the «Black rice» debate and to the historiographical issues it raises, and also a first sketch of the barely explored, yet essential, place of Portugal in anchoring the circuits of rice's seeds and knowledge within the Atlantic square of rice, and in the wider frame including the routes from the Mediterranean and Indian Ocean.

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