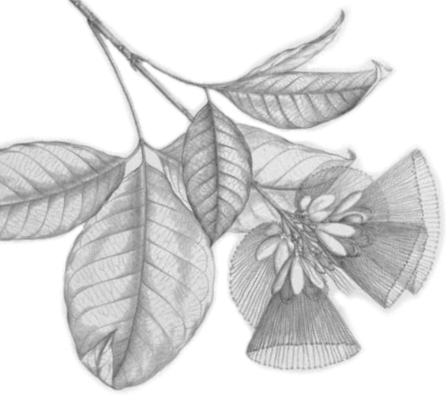

Objects, Histories and Encounters: British Guiana Seen Through Balata

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ABSTRACT

Balata or bullet tree of Guiana was known as one of the finest forest trees of British Guiana. This paper is based on reports from the 19th and 20th centuries (mainly from George Jenman and Everard im Thurn), publications, newspapers, and correspondence on British Guiana's balata, a rubber-like material. These references were cross-referenced with objects related to balata that are now preserved at the collection of Economic Botany, Royal Botanic Gardens, Kew, as well as with contemporary reports from Guyanese Amerindian. By doing this, a more precise image of this less known rubber material from Guyana came forth, as well as the issues and histories behind it, namely the cross-cultural encounters, the objects significance and their context, and how the colony was managed. Despite the fact that balata was seen, during the last years of the 19th century, as an alternative commodity and a possible answer to the sugar crisis, not much was done to improve its trade.

Keywords: Balata; Guiana Britânica; Everard im Thurn (1852-1932); George Samuel Jenman (1845-1902).

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> "By helping preserve the multiple varieties of human understanding of the natural world, we go to the heart of preserving cultural diversity. And perhaps we will improve the possibility of constructive cultural reconciliation in a deeply troubled world." (Chambers & Gillespie 2001 p.232)

These words by David Wade Chambers and Richard Gillespie reflect the importance of preserving human knowledge concerning the understanding of the natural world to protect cultural diversity. Having this in mind, one of the purposes of this paper is to discuss the unknown historical role of balata as its history seems to have been somehow forgotten or not explored. When rubber is mentioned, usually the species *Hevea brasiliensis*, *Ficus elastica* or *Palaquium gutta* = *Isonandra gutta* among others, are referred. Very rarely academic papers discuss the case of balata (*Manilkara bidentata* and *Mimusops balata*) in British Guiana (nowadays Guyana) (Govaerts et al. 2014a, 2014b; The Plant List 2013a; Tully 2011; Ross 2017).[2]

The balata latex comes from several species of the *Mimusops* trees (Sapotaceae family) and, according to Hubert Terry the species *Mimusops balata* was the main source, a plant indigenous to British Guiana (Terry 1907: 281; Brannt 1900: 304). In this paper, particular attention is given to the balata from the bullet tree of Guiana (*Manilkara bidentata* = *Mimusops globosa*) because the cultural objects analysed were made from the latex of this species which was known as one of the finest forest trees of British Guiana (van Andel 2000 p.115; Jenman 1882; Jenman 1883; The Plant List 2013b).

This latex was considered an intermediate between India-rubber (*Ficus elastica*) and gutta-percha (*Palaquium gutta* = *Isonandra gutta*) because it combines the properties of both (Jenman 1885; The Plant List 2013a; Govaerts et al. 2014b). However, while gutta-percha becomes brittle and hard due to air and light action, balata remains unchanged for an extended period (Brannt 1900 p.309). Raw balata has different colours, from grey to brown, and even red, depending on the colour of the wood and bark and 'feels soapy to the touch' (Terry 1907 p.285; Brannt 1900 p.307). Because of its tone and appearance of horse-flesh, the Dutch gave it the name *paardenflesh* (horseflesh) (Brannt 1900 p.304).

The latex, known as milk, used to be drunk by the Amerindians and when diluted with water was used as a substitute to cow's milk (Brannt 1900 p.305). In British Guiana the latex was called *purvio* and collected in wooden vessels because the iron vessels could turn the latex black, depreciating its commercial value (Brannt 1900 p.307). According to Sir William Holmes, the fresh latex could also be used as an excellent waterproofing material (Holmes 1864).

[2] Guyana is a proud and independent nation since 1966 with a rich culture. Throughout this paper and so as to maintain an identity with the time of the events, the country will often be referred to by its former colonial name: 'British Guiana'.

The first time balata became known to science was in an article published in 1857 by Prof. Bleekrode in the Society of Arts, in which he designated balata as the gutta percha of Surinam (Bleekrode 1857). In this way, for many years, balata was considered to be gutta-percha and only around 1880's was it recognised as a distinct substance (Terry 1907 p.281). In Europe, during the 1900's, balata was used for belting manufacture, mainly for industrial belts used in machinery (Terry 1907 p.281-282). The balata from *M. balata* and *M. globosa* were considered especially valued because of its strength and for being ductile to the degree that was suitable for the belting manufacture (Brannt 1900 p.308). According to Hubert Terry, 'the applications of balata have been kept somewhat as trade secrets' as the quantity of balata used in the submarine cable manufacturer was not known, and the same happened in the production of golf balls (Terry 1907 p.282; Dean 1939). Despite it being referred to by an American firm of manufacturers as 'the best gum in the world' and Dr Hugo Muller saying it has excellent purity when compared with gutta-percha, and also seen as an alternative commodity to a possible answer to the sugar crisis, the gum of the bullet-tree never found a place within the market like the other rubbers did, probably due the existence of a parallel trade, which will be explained later in this paper (Jenman 1882; Jenman 1883; Jenman 1885 p.176-179; van Andel 2000 p.51). The severe crisis that British Guiana was passing through during the 19th century was caused by the production of beet sugar by Germany and other countries, which offered competitive prices (Anonymous 1886 p.13; Rodney 1981 p.661). In the case of Germany, it is important to note that the numerous beet sugar factories used the balata belting in their machinery because it was the most suitable rubber material that could resist to the chemicals involved in the sugar process (Terry 1907 p.286-287).

THE BALATA COLLECTORS AND THE LATEX EXTRACTION

According to George Samuel Jenman (1845–1902), British botanist and gardener, the first exportation of balata gum to Britain occurred around the 1860s on Dr Van Holt's suggestion after he visited Surinam (Jenman 1882 p.66; Jenman 1885 p.180-181). Since then, exports started to increase, reaching 20,000 lbs (around 9,070 kg) in 1865 and, after some market fluctuations, 47,483 lbs (around 21,500 kg) in 1877 and 93,573 lbs (42,444 kg) in 1881 (Jenman 1882 p.66-67; Jenman 1883 p.32). However, it is important to note that there was 'no export duty on balata', no checks were exercised by the Custom House Officers, and the numbers above were provided by its exporters (Jenman 1885 p.182). Also, as Jenman illuminates, the colony did not make a significant profit by trading its forest products:

> From the products of our forest which are utilised, important as they undoubtedly are, the colony derives hardly any profit, while the forests are impoverished by wanton waste and the depredations of the dishonest, and the trade is in the hands of a few merchants. As to the balata trade, unless some efficient method of utilising the whole of the bark be discovered,

> felling should be prohibited, and, if, with this rule, an export tax were imposed, and every package containing the gum required to bear a special brand belonging to the grant on which it was gathered (Jenman 1883 p.32).

The colony hardly got any profit from the forest products probably because of the existence of a parallel economy in which the trade was 'in the hands of a few merchants' (Jenman 1883 p.32). Jenman seemed to be genuinely concerned about this, not only with the dishonest trade itself but also with the methods employed to extract the balata latex, which could lead to the forest impoverishment. The trees were 'being felled by the Indians for the balata they yield, at the insistence of traders who travel up the river purchasing the products procurable from the native inhabitants' (Jenman 1883 p.30). The Amerindians were allowed to cut timber of a specified size limit, and that it should be used by them, which, according to Jenman, did not give them the right to cut the trees for this commercial purpose, or to 'tapp trees for the juice of their barks' (Jenman 1883 p.30-31).

Everard im Thurn (1852-1932) botanist, explorer, photographer and British colonial administrator, also commented on this particular trade in which 'some half-dozen regular traders, black people or coloured, who almost constantly move about in their boats, or 'floating shops', carrying cheap European goods to the Amerindians and obtaining in return such produce as these people have to give' (im Thurn 1883 p.238). In this case, it is visible the cross-cultural exchanges that were taking place by the trade of Amerindian products and European goods. The products that the Amerindians had to offer were forest products. Balata was among these, and the way the balata latex was extracted was a 'wasteful method in which it has been carried on, the tree is now not far from being exterminated' according to im Thurn (im Thurn 1883 p.238).

Jenman also considered the Amerindians to be 'committing a depredation for which they should be held responsible on detection' and 'much more should the men who instigate them to it for their own profit, knowing that they could not do it with impunity themselves, be severely punished for their villainy' (Jenman 1883 p.31). Im Thurn added to this:

> [The balata] is collected by the most injurious method of felling the trees, chiefly by one man, a coloured man from the coast, who makes his living, and it is apparently no bad one, by collecting this balata (...). This is of course wholesale robbery and wilful destruction of Crown property; and I am the Superintendent of Crown lands in this district [Pomeroon]! But though I can lay my hands on this robber, and perhaps on others, almost any day, I have no power to deal with such cases (Jenman 1883 p.31).

Here it is possible to see how the colony was being managed but also which decisions were taken regarding forest policies and the Amerindian's rights to their lands. Jenman added to this:

> Nearly the whole of the forest land of this colony is Government property. It goes under the title of Crown Lands. Portions of it are let out under certain stated conditions, fixed by ordinance, in blocks (Jenman 1885 p.182).

During the occupancy, when specific forest areas were let, an annual rent of 30 cents per acre was charged (Jenman 1885 p.183). The Amerindians were allowed to cut a maximum of 12 inches square of timber which, according to Jenman, was a 'privilege that is greatly abused, and to take any substance off the uncut Crown lands' (Jenman 1885 p.183). In Jenman's discourse, he refers to the Amerindian's lands as belonging to the 'Crown lands' and that the Amerindians were abusing that privilege. He also cites the case of Berbice where the majority of the balata collected was not from the grants but from Crown lands (Jenman 1885 p.184). However, it is important to stress that the majority of balata collectors were 'not the true river residents', so they were not local Amerindians that were allowed to cut timber. Instead, they were from New Amsterdam and surrounded areas or New Forest (Jenman 1885 p.185). Nevertheless, Jenman was concerned not only with the Crown lands situation but also with the Amerindians themselves, as the following text indicates:

> It is notorious that unscrupulous men use the privileged and almost uncontrolled liberty which Indians enjoy to make use of any forest product, to evade the law and its obligations as regards themselves. The colony is thus defrauded, and the duped Indian, who is led by such men very often transgress the limit of his privilege, is also done out of the fair reward he should receive for his labour. All this would at once be stopped if it were made illegal for anyone to purchase from an Indian except through the Government agent, who in this capacity would act as protector both of Indians and of Crown lands (Jenman 1885 p.229).

As the majority of the balata collectors were not Amerindian and, when this happened, they were usually being manipulated by the traders, Jenman suggested that the Government should review the 'privileges accorded to the aboriginal Indians' in order to respond to this situation and protect the 'Crown lands' and the forests in British Guiana (Jenman 1883 p.32).

It is not very clear what happened afterwards regarding this matter, but the Amerindians in Guyana still mention today[3] that they had to pay for a piece of land every year if they decided to settle in a particular place. When the Amerindian in charge of paying the rent died, his or her son continued to pay and only in the mid-1990s did the Guyana Government give the land to the Amerindian Villagers, so this annual fee is no longer applied.[4] Nowadays, according to *The New Amerindian Act* (2005), the Amerindians have 'rights over forests and forest products' (The Ministry of Amerindian Affairs Guyana 2009).

About the balata extraction, there are two methods to collect it: the already mentioned one, involving felling the trees before they are taped and the other one in which the trees are tapped while

[3] In this research, which involved a fieldtrip to Guyana, data collection such as direct observations as well as interviews with focal groups were conducted in some of the Makushi and Arawak communities, adding a Guyanese perspective to this body of research. However, it is important to stress that the conducted interviews were not part of an in-depth anthropological study *per se*.

[4] Interview with Leoni from MRU (Makushi Research Unit), which took place in Fair View Village, Guyana (October 2010).

they are still standing (Jenman 1885 p.193). However, it is worth mentioning that when comparing Venezuela and the Guianas, the felling of the trees was more the exception than the rule, in the later one (Terry 1907 p.282). The felling system was used because it was 'the more profitable for quick extraction and immediate profits' not thinking of course in the long-term sustainability (Terry 1907 p.283).

Another aspect referred in the case of Venezuela is that it was more common to collect balata during the wet season. However, if the season was drier than expected, it was difficult for the latex to run from the incisions in the bark, even when the trees were felled (Terry 1907 p.283). Also, if the locals were not collecting for themselves, they would be hired by merchants who would prepare an expedition, with the necessary food and equipment, for obtaining the balata (Terry 1907 p.284).

Jenman carefully described the process of extracting the balata in his report entitled 'Balata and the balata industry' (1885). In this process, the bark of the bullet tree was channelled to obtain the balata latex by using a cutlass (Figure 01) (Jenman 1885 p.191). The balata latex started to run from the bullet-tree and split calabashes were used to collect it (Jenman 1885 p.190). Jenman was unable to discover if the Amerindians extracted balata in the past. According to him, it was likely that they did not: 'so far as can be gathered, the credit of discovering its promising commercial character belongs to the neighbouring colony of Suriname' (Jenman 1885 p.180).

Figure 01. Detail of the bullet tree of Guiana bark (Manilkara bidentata) where it is possible to see the marks of balata past extraction

Source: Guyana, October 2010, © Copyright Sara Albuquerque

After Jenman's report was published (1885), the balata exploitations boomed and reached a peak between 1913 and 1924. It was harvested by Creole and Amerindian 'balata bleeders' who would climb the trunk of the trees to collect it (Jenman 1885 p.191; Fanshawe 1948). This confirms what is still recalled by contemporary inhabitants in Guyana. In the 1930s the production decreased because virgin balata areas could no longer be profitable and also because balata was replaced by synthetic materials (van Andel 2000 p.152).

D.B. Fanshawe noted that once the bark was bled, it could not be drained again until the bark was regenerated, which could take between 8 to 10 years. After this time, on the second tapping, the 'latex production is only a third of the original yield and poorer in quality' (Fanshawe 1948). This may explain why the bullet trees were felled to harvest balata. Felling the trees yielded much more latex than if they were tapped while standing, but it destroyed the source of future harvests (Fanshawe 1948).

Through the example of balata it is possible to have some glimpses on how the Amerindians were seen, but also to notice a particular contradiction from Britain towards them. On the one hand, the Amerindians had to be protected from the abusive traders that were also promoting the quick latex extraction which could lead to the extinction of balata trees, and, on the other, they were not behaving correctly and abused the privileges of the use of the Crown land.

WHAT CAN OBJECTS TELL US ABOUT BALATA

Royal Botanic Gardens, Kew's collections started in 1847, under the directors William Jackson Hooker (1785–1865) and his son, Joseph Dalton Hooker (1817–1911), when scientific research expanded and the botanical institution became essential to the developing empire (Endersby 2008; Albuquerque 2013; Cornish 2013; Nesbitt & Cornish 2016). Nowadays, Kew's collections constitute an unparalleled resource not replicated in any other institution, holding the 'earth's largest and most diverse botanical collections, including reference collections'[5]. The Economic Botany Collection, Kew, holds specimens from British Guiana that are made of balata or are related to it (Table 01).

Table 01. Objects related to balata (*Manilkara bidentata* (A. DC.) A. Chev. = *Mimusops globosa* C.F. Gaertn.) from Guyana (formerly British Guiana), Economic Botany Collections, Royal Botanic Gardens, Kew

Catalogue Number	Entry Book Number	Artefact Description	Plant Part Held	Donor	Notes
50908	109. 1884	Balata	Exudate	Jenman, GS	Label source: Dried by precipitation with spirits of wine British Guiana 5.6.84
50909	86. 1886	Balata	Exudate	Colonial & Indian Exhibition 1886	
50941	25. 1886	Lagenaria fruit for collecting Balata	Fruit	Jenman, GS	Label source: Fruit of Lagenaria vulgaris Ser. in which collectors of Balata bring the milk from the forest to the settlement.

[5] Royal Botanic Gardens Kew, 'Collections' <http://www.kew.org/collections/index.htm> [accessed 13 September 2012].

50942		Balata	Exudate	Colonial & Indian Exhibition 1886	
50937	101.1882	Dish of Balata	Exudate	im Thurn, Sir EF	
50933	101. 1882	Balata	Exudate	im Thurn, Sir EF	
50931	86. 1886	Two rolls of Balata		Colonial & Indian Exhibition 1886	Label source: 2 rolls – one as page 1,2 = purified rolled balata from Surinam, 126.1908. From Mr JG Von Hemert, International Rubber Exhibition 1908.
12047	163. 1886	Wood	Wood	Colonial & Indian Exhibition 1886	

Source: Adapted from Royal Botanic Gardens Kew 2012.

In Brannt's report, some of these balata samples that were sent to the Kew Museum by im Thurn in 1882 from Demerara (Guyana) and by G.S. Jenman in 1884, as well as balata prepared by precipitation with alcohol and balata milky juice are mentioned (Brannt 1900 p.304). Im Thurn collected a large block of balata and a dish made of balata, which illustrates how this gum had multiple uses, such as the production of utensils (Figure 02).[6] The objects listed in the table were mainly sent by Everard im Thurn and G.S. Jenman. Furthermore, other objects were sent from the Colonial and Indian Exhibition of 1886, in which im Thurn was involved. Everard im Thurn was in charge of the ethnological stand at the British Guiana court in this particular exhibition (Albuquerque 2016).

Figure 02. From left to right: Dish modelled in balata (EBC50937) and a specimen of balata (EBC50933) collected by Everard im Thurn in Demerara, British Guiana, 1882.

Source: © Copyright The Board of Trustees of the Royal Botanic Gardens, Kew

Although not very common nowadays, it is possible to find some objects in Guyana that are made of balata, including bottles, cups, dishes and figures. These last ones represent aspects of the Amerindian life, such as the production of cassava bread, the base of the local diet (Figure 03).

[6] Royal Botanic Gardens, Kew, London, UK [RBG, Kew], Directors Correspondence, KLDC11582, Letter from Everard F. [Ferdinand] im Thurn to [Sir William Thiselton-Dyer], from Georgetown [Guyana], 25 May 1882, folio 301.

Figure 03. From left to right: Bottles made of balata (Annai, Guyana, October 2010); Figure made of balata representing Amerindian women making cassava bread.

Source: Liana Cane Factory, Georgetown, Guyana, October 2010, © Copyright Sara Albuquerque

Besides the objects collected by im Thurn, the botanist Jenman, in one of his letters to Kew dated from 19 February 1886, mentions that he was sending a container made of *Lagenaria vulgaris*, which was used for carrying balata latex. This item is still preserved in the collections at Kew (Figure 04).[7] Despite the short description of the notes attached to the object, Jenman mentions in detail, in the journal *Timehri*, the use of split calabashes to collect balata (Jenman 1885 p.190). He explains that when the calabashes were full, the latex was poured into the container by using a 'funnel to conduct it into the narrow orifice [that] is made of a piece of palm, maranta, or other broad leaf' (Jenman 1885 p.197). Jenman describes this container as a natural bottle known as a *goobee*, which had the 'size and shape of an ox bladder' and could hold up to two gallons (Jenman 1885 p.191). The *goobee* is the fruit produced by a gourd *Lagenaria vulgaris*, which is similar to a pumpkin vine. A hole was made in the *goobee* 'near the scar where the stem was connected to the fruit, and the contents of seed and pith scraped out', which leaved a sturdy and robust shell.

[7] RBG, Kew, Directors Correspondence, KLDC11703, Letter from G.S. [George Samuel] Jenman to The Royal Botanic Gardens, Kew, from Government Botanist's Office, Georgetown, Demerara [Guyana], 19 February 1886, folio 469.

Figure 04. The container used to collect balata from the gooba fruit (Lagenaria vulgaris Ser.) obtained by G.S. Jenman in British Guiana (EBC50941) - Economic Botany Collection, Kew

Source: © Copyright The Board of Trustees of the Royal Botanic Gardens, Kew

To protect the shell and to affix a handle, it was laced with 'an open work of *mamourie* – the split stem of a climbing *Cardulovica* – to which a long looped handle of the same material is attached. This enables it to be carried over the shoulder of the collector' (Jenman 1885 p.191) (Figure 05). Jenman continues explaining how the balata collectors had to carry the *goobees*:

Figure 05. Amerindian balata collector carrying containers used to collect balata

Source: © Copyright Maria Albuquerque

> On the return journey they are balanced by being hung before and behind, usually two each way, and the rapid traveller has to be careful that he does not slip, make a false step into one of the coquerite pitfalls, or trip into collision with a tree, for they are easily cracked by a blow thus given, and the milk at once escapes. When filled, the orifice is stopped by a cork cut from the bullet-tree bark, round the edges of which clay is rubbed to prevent any leakage by jolting on the way (Jenman 1885 p.191).

In this *goobee* or *gooba* the balata latex was transported to the settlement and can be sold as it is or 'poured into shallow wooden evaporating dishes' (Brannt 1900 p.306). These trays or vessels were used to dry the balata. In the case of the balata sample collected by im Thurn, the balata probably dried in a vase and this is why it presents a vase figure (Figure 02) (Jenman 1885 p.204). Terry also mentions the balata coagulation in which the latex is exposed to the sun in 'shallow pans made of tinplate or of wood lined with leaves' where by doing this, a sheet of balata is obtained (Terry 1907 p.284).

These objects also reflect the hard work of the different people involved – men and women, Amerindians and non-Amerindians – not only in extracting the balata but also in the process itself, from collection to transportation and trading of the balata. In Jenman's report, he indicates that few families were found on creeks collecting balata (Jenman 1885 p.187). When the collecting ground was not too distant, women sometimes accompanied the men, cooking or assisting 'in laying out the calabashes and collecting the milk, while the men fell and ring the trees' (Jenman 1885 p.187). Jenman also notes how tough a balata collector's life was (Jenman 1885 p.186):

> They undertake, as I have shown, long and lonely journeys through unknown and deep untrodden forest; they are constantly wet, always ill-clad for exposure, and often short of food; they suffer much from rheumatism brought on by privations and exposure, which after a few years becomes chronic in cases and quite disables them from continuing the life (Jenman 1885 p.187).

The Amerindians in Guyana still discuss today the hard life of the balata collectors. According to Leoni, her grandfather worked for the Balata Company in the 1920s and had to walk from the Demerara River to the interior, which could take one month of travelling each way.[8] Her husband also worked in the company in the 1980s. She said it was the hardest job because the collectors had to climb a tall and sharp tree using their feet to extract the balata from morning until dawn. Besides this, it was challenging at the end of the day to carry three to five bags of balata latex.

There are also descriptions of Venezuelan balata collectors in which it is mentioned how they were forced to go through the 'dense undergrowth of the sunless forest' that was commonly fatal even for the most adapted ones (Terry 1907 p.283).

[8] Interview with Leoni from MRU (Makushi Research Unit) which took place in Fair View Village, Guyana (11 October 2010).

In the correspondence at RBG, Kew archives it is possible to notice Jenman's involvement with the balata issue due to the consistency of his descriptions, observations and expeditions, which is also reflected in his reports on *Timehri*.[9] Jenman's commitment is not surprising, considering that he was the Government Botanist in charge at the time, and that it was his function to investigate the economic potential of the species in this British colony. Here, Kew's role took vital importance because Jenman, like im Thurn, depended on the institution's experts to confirm the identification of the species, as well as to have access to resources (references and material, for instance).

As mentioned previously, it is possible to find some objects in contemporary Guyana that are made of balata, including bottles, dishes and figures. Some of the balata utensils are similar to the ones collected by Everard im Thurn. This can be interpreted as cross-cultural experiences, in which, on the one hand, the Amerindians started to produce 'western like' utensils by using the available resources, in this case, balata and, on the other, the colonisers also adapted themselves to the available resources and started to produce utensils made with balata.

The balata had an enormous impact on the life of the Amerindians, and its historical value surpasses its economic importance (van Andel 2000 p.51; Jenman 1882; Jenman 1883). Today, balata still brings many vivid memories to the Amerindians. The hard work related to it, the several months spent in the forest, the diseases and food shortage.

By contextualising the objects at Kew, they gain another dimension. The cross-reference of materials and information allow us to see the objects at Kew within an Amerindian context. The balata container (Figure 04) is an excellent example that demonstrates how by crossing reports, correspondence and object labels, it is possible to contextualise the objects. By doing this, the object is not only contextualised and the procedures involved with it better understood, but it also illustrates the life of the balata collector.

DISCUSSION AND CONCLUSION

Looking through the case of balata it is possible to have a glimpse of the economic and political situation in the British colony at the end of nineteen century and early twentieth century.

[9] RBG, Kew, Directors Correspondence: KLDC11683, Letter from G.S. [George Samuel] Jenman to [Sir William Thiselton-Dyer], from Government Botanist's Office, Georgetown, British Guiana [Guyana], 4 June 1884, folios 446-447; KLDC11684, Letter from G.S. [George Samuel] Jenman to Sir William Thiselton-Dyer, from Government Botanist's Office, Georgetown, British Guiana [Guyana], 5 June 1884, folio 448; KLDC11685, Letter from G.S. [George Samuel] Jenman to Sir William Thiselton-Dyer, from Government Botanist's Office, Georgetown, British Guiana [Guyana], 25 June 1884, folio 449; KLDC11687, Letter from G.S. [George Samuel] Jenman to [Sir William Thiselton-Dyer], from Government Botanist's Office, Georgetown, British Guiana [Guyana], 25 August, folios 451-452; KLDC11693, Letter from G.S. [George Samuel] Jenman to The Royal Botanic Gardens, Kew, from 12 Panton Street, Cambridge [England], 2 May 1885, folio 458; KLDC11703, Letter from G.S. [George Samuel] Jenman to The Royal Botanic Gardens, Kew, from Government Botanist's Office, Georgetown, Demerara [Guyana], 19 February 1886, folio 469.

Jenman's reports reflect the concerns related to deforestation, in particular towards the balata tree and in the case of im Thurn's reports, it is mentioned the situation of unscrupulous merchants taking advantage of the Amerindians when collecting balata.[10] Taking into consideration the vasteness of the Guyanese territory, it must have been challenging for the British authorities to supervise the forest products, such as balata and eventually making profits from these products.

Despite balata beeing seen as an alternative trading commodity and a possible answer to the sugar crisis as mentioned before 'an important item to the exports of the colony [British Guiana]', very little was done to make this happen according to the *Scientific American* (Anonymous 1885; Holmes 1864; Jenman 1882; Jenman 1883; Mangar 2009; van Andel 2000). However, it is worth mentioning that the same balata that was seen as a possible solution for the sugar crisis was also, ironically, contributing to the growth of the beet sugar factories in Europe, because it was considered the most suitable material to be used in the belting machinery involved in the sugar process.

Balata was purer than gutta-percha (that was commonly used to isolate submarine cables) containing less dirt, making it superior regarding electrical properties and with lower water absorption, essential characteristics regarding sea telegraph cables (Kemp 1931 p.135). So why was balata unsuccessful? Why was it not used as a substitute of gutta-percha, taking into consideration its superior quality and properties, and why so little was done to make it a valuable international trade item from British Guiana? There are several possible reasons for this. It is nonetheless possible to infer the following:

- **High production costs**. Balata possessed much of the elasticity of the India-rubber and the flexibility of the gutta-percha but not the intractability of the first and the brittleness or friability of the second. Although balata was considered superior to gutta-percha, its production was costly, and its drying and coagulation process was long (Holmes 1864). According to Prof. Bleekrode, even when the balata latex was exposed to the air, during the hot days, it would not clot (Bleekrode 1857 p.626);
- **The existence of a parallel economy.** British Guiana hardly got any profit from the forest products because the trade was controlled by a handful of merchants. This could be the reason why there was no investment in balata as an essential item to the exports of the colony;

[10] RBG, Kew, Directors Correspondence, KLDC11582, Letter from Everard F. [Ferdinand] im Thurn to [Sir William Thiselton-Dyer], from Georgetown [Guyana], 25 May 1882, folio 301.

- **Few species of balata trees.** Taking into consideration the small number of the balata species, the balata gum was produced in far fewer quantities when compared with gutta-percha who's gutta-type latex could be extracted from around eight species of trees (Kemp 1931 p.134; Kaur 1998 in Tully 2009 p.567);
- **Higher price.** Because of its superior quality, it demanded a higher rate when compared with gutta-percha, and it was only used for high-quality items (Anonymous 1885);
- **Not adequate for telephonic cables.** The development of the telephonic communication required a much superior quality of transmission, so the energy losses in the insulating material were an essential factor to take into consideration. In the case of balata and gutta-percha, although they were used for the insulation of long deep sea telegraph cables, the dielectric losses were too high, precluding its use on submarine telephone cables (Kemp 1931 p.132);
- **Panic in the industry.** Due to the great gum demand (gutta-percha in particular from the forests of Southeast Asia), this almost lead to the extinction of the wild trees of *Palaquium* sp. = *Isonandra* sp. at the end of the 19th century due to the practices of unsustainable extraction methods which killed the trees. This caused panic in the industry that took the natural resource as granted, leading to the appearance of new substitutes, the synthetic plastics (Tully 2009);
- **The rise of synthetic rubbers.** After World War II, when synthetic alternatives became more available, the uses of natural products, like natural rubbers, decreased (Tully 2009 p.578).

Probably for these reasons, balata did not succeed in the market, not even getting the status of a commodity. However, taking into consideration the objects at Kew and the histories they reveal, British Guiana's balata seems to have had a critical role in the social history of this country, more than its economic value might have predicted.

By looking closely at the container used to collect the balata latex (Figure 04), it is possible to contextualise it, see it on its 'habitat' and unveil some possible stories behind it. By cross-referencing the information in the object label with the several reports on balata and by interviewing Guyanese Amerindians nowadays, it is possible to have a glimpse of how physically demanding the work of collecting balata was. It was not only challenging to climb the trees, hard to carry the balata while being subjected to diseases and food shortages, but also extenuating to move two calabashes in each way

while walking through the dangerous forest. There is no doubt that collecting balata was often a hazardous and unpleasant work.

The balata industry also reveals several implications regarding the relations between the local people and the colonial power. The forest land was considered Crown property, so the Amerindians only had access to a certain amount of area in order to explore a limited part of its resources. In addition to this, they had to pay an annual fee because they were living in the 'crown land'. This situation does not happen nowadays, but it is clear how balata is still very present today in the memories of the Amerindians, in their speech and in some of the objects produced for tourists.

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REFERENCES

Albuquerque S 2013. *Exploring Tropical Nature in British Guiana: RBG, Kew's Collections Revisited*, PhD Thesis, Birkbeck College, University of London.

Albuquerque S 2016. Glimpses of British Guiana at the Colonial and Indian Exhibition, 1886. *Culture & History Digital Journal*, 5(June), p.e010.

Anonymous 1885. Balata. *Scientific American*, 53(9):133.

Anonymous, 1886. The Colonial and Indian Exhibition: British Guiana. *The Times*, p.13.

Bleekrode S 1857. Gutta Percha of Surinam. *Journal of the Society for Arts*, 5(255):625–627.

Brannt WT 1900. *India rubber, gutta-percha, and balata: occurrence, geographical distribution, and cultivation of rubber plants; manner of obtaining and preparing the raw material, modes of working and utilizing them, and statistics of commerce*, Lancaster: Wickersham Printing Company.

Chambers DW, Gillespie R 2001. Locality in the History of Science: Colonial Science, Technoscience, and Indigenous Knowledge. *Osiris*, 15:221–240.

Cornish C 2013. *Curating Science in an Age of Empire: Kew's Museum of Economic Botany*, PhD Thesis, Royal Holloway, University of London.

Dean JN 1939. Gutta-Percha and Balata in Submarine Cable Insulation. *Industrial & Engineering Chemistry*, 31(6):699–704.

Endersby J 2008. *Imperial Nature: Joseph Hooker and the Practices of Victorian Science*, Chicago and London: The University of Chicago Press.

Fanshawe DB 1948. Forest products of British Guiana, part II. Minor Forest Products. In *Forestry Bulletin No.2*. British Guiana: Forestry Department.

Govaerts R, Barker C et al. 2014a. Euphorbiaceae. *World Checklist of Selected Families, p.Royal Botanic Gardens, Kew*. Available at: http://apps.kew.org/wcsp/home.do.

Govaerts R, Harvey Y et al. 2014b. Sapotaceae. *World Checklist of Selected Families, p.Royal Botanic Gardens, Kew*. Available at: http://apps.kew.org/wcsp/home.do.

Holmes W 1864. Substitutes For Gutta-Percha. *Journal of the Society for Arts*, 12(589):245.

im Thurn EF 1883. Between the Pomeroon and the Orinoco. *Timehri, The Journal of the Royal Agricultural & Commercial Society of British Guiana*, 2:211–239.

Jenman GS 1882. India-Rubber and Gutta-Percha. *Timehri, The Journal of the Royal Agricultural & Commercial Society of British Guiana*, 1:44–82.

Jenman GS 1883. India-Rubber and Gutta-Percha Trees of British Guiana. *Timehri, The Journal of the Royal Agricultural & Commercial Society of British Guiana*, 2:12–32.

Jenman GS 1885. Balata and the Balata Industry. *Timehri, The Journal of the Royal Agricultural & Commercial Society of British Guiana*, 4:153–233.

Kaur A 1998. A History of Forestry in Sarawak. *Modern Asian Studies*, 32(1):124.

Kemp AR 1931. Paragutta, A New Insulating Material for Submarine Cables. *Bell System Technical Journal*, 10(1):132–148.

Mangar TC 2009. Guiana: história e desenvolvimento econômico. *Diplomacia, Estratégia & Política*, (10):149–161.

Nesbitt M, Cornish C 2016. Seeds of Industry and Empire: Economic Botany Collections Between Nature and Culture. *Journal of Museum Ethnography*, (29):53–70.

Rodney W 1981. Plantation Society in Guyana. *Review* (Fernand Braudel Center), 4(4):643–666.

Ross C 2017. Colonialism, Rubber, and the Rainforest. In *Ecology and Power in the Age of Empire*. Oxford: Oxford University Press, p. 99–130.

Royal Botanic Gardens Kew [homepage on the Internet]. *'Collections'*. [cited 2012 Sep 13]. Available form: http://www.kew.org/collections/index.htm.

Terry HL 1907. *India-Rubber and its Manufacture. With Chapters on Gutta-Percha and Balata*, London: Archibald Constable & Co. Ltd.

The Ministry of Amerindian Affairs Guyana, 2009. Amerindian Act 2005. *Legislation*. Available at: http://amerindian.gov.gy.

The Plant List, 2013a. Ficus elastica Roxb. ex Hornem. *The Plant List*, p.Version 1.1. Available at: http://www.theplantlist.org/.

The Plant List, 2013b. Mimusops globosa C.F.Gaertn. *The Plant List*, p.Version 1.1. Available at: http://www.theplantlist.org/.

Tully J 2009. A Victorian Ecological Disaster: Imperialism, the Telegraph, and Gutta-Percha. *Journal of World History*, 20(4):559–579.

Tully J 2011. *The Devil's Milk: A Social History of Rubber*, New York: Monthly Review Press.

van Andel T 2000. *Non-timber Forest products of the North-West District of Guyana Part II: A field guide*, Georgetown, Guyana: Tropenbos-Guyana series 8B.

MANUSCRIPTS

RBG, Kew, Directors Correspondence, KLDC11683, Letter from G.S. [George Samuel] Jenman to [Sir William Thiselton-Dyer], from Government Botanist's Office, Georgetown, British Guiana [Guyana], 4 June 1884, folios 446-447.

RBG, Kew, Directors Correspondence, KLDC11684, Letter from G.S. [George Samuel] Jenman to Sir William Thiselton-Dyer, from Government Botanist's Office, Georgetown, British Guiana [Guyana], 5 June 1884, folio 448.

RBG, Kew, Directors Correspondence, KLDC11685, Letter from G.S. [George Samuel] Jenman to Sir William Thiselton-Dyer, from Government Botanist's Office, Georgetown, British Guiana [Guyana], 25 June 1884, folio 449.

RBG, Kew, Directors Correspondence, KLDC11687, Letter from G.S. [George Samuel] Jenman to [Sir William Thiselton-Dyer], from Government Botanist's Office, Georgetown, British Guiana [Guyana], 25 August, folios 451-452.

RBG, Kew, Directors Correspondence, KLDC11693, Letter from G.S. [George Samuel] Jenman to The Royal Botanic Gardens, Kew, from 12 Panton Street, Cambridge [England], 2 May 1885, folio 458.

RBG, Kew, Directors Correspondence, KLDC11703, Letter from G.S. [George Samuel] Jenman to The Royal Botanic Gardens, Kew, from Government Botanist's Office, Georgetown, Demerara [Guyana], 19 February 1886, folio 469.

Royal Botanic Gardens, Kew, London, UK [RBG, Kew], Directors Correspondence, KLDC11582, Letter from Everard F. [Ferdinand] im Thurn to [Sir William Thiselton-Dyer], from Georgetown [Guyana], 25 May 1882, folio 301.

Objectos, Histórias e Encontros: A Guiana Inglesa vista através da Balata

RESUMO

A árvore da balata foi conhecida como sendo uma das melhores árvores florestais da Guiana Britânica. Este artigo baseia-se em relatos dos séculos XIX e XX, publicações, jornais e correspondência sobre a balata da Guiana Britânica, um material semelhante à borracha. Estas referências foram cruzadas com objectos relacionados com a balata que se encontram na colecção de Botânica Económica, nos Jardins de Kew, e relatórios contemporâneos de ameríndios guianenses. Ao se cruzar estas informações, surgiu uma imagem mais clara da balata, bem como das histórias por detrás desta matéria-prima, nomeadamente: os encontros interculturais, o significado dos objectos e seu contexto, e como a colónia estava a ser gerida na época. Também se chegou à conclusão de que, apesar de a balata ter sido vista, durante os últimos anos do século XIX, como uma comodidade alternativa e uma possível resposta à crise do açúcar, não houve grande investimento para melhorar o seu comércio.

Palavras-Chave: Balata; Guiana Britânica; Everard im Thurn (1852-1932); George Samuel Jenman (1845-1902).

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