DUTCH CROSSING, November, 2016, 1–17

Mangroves – Captured By The Keen Eye Of A 17th Century Landscape Painter

Nico Koedam
Vrije Universiteit Brussel (VUB), Brussels, Belgium
Farid Dahdouh-Guebas
Université Libre de Bruxelles (ULB), Brussels, Belgium
Roberto Lima Barcellos
Universidade Federal de Pernambuco, Recife, Brazil
Tom Van der Stocken
Vrije Universiteit Brussel (VUB), Brussels, Belgium

Artists and scientists alike came across unfamiliar landscapes and strikingly strange fauna and flora when they embarked for the 'colonies'. In the 17th and 18th centuries curiosity for the exotic developed into direct scientific observation, which is often still appreciated scientifically today, such as in biological taxonomy. Often observation, interpretation and reporting were geared towards functional aspects, a resourcist view on the environment in the wake of the colonial enterprise. This entailed that focus could be biased towards aspects of mercantile, political or strategic interest. Landscape vision is no exception for the possible biases. The Dutch painter Frans Post during his 7 year stay in the New World (Brazil) in the 17th century was the first to depict mangroves as a very characteristic tropical vegetation, unfamiliar to Europeans, in spite of its limited interest in the context of colonial economy. He did this in the strong and developing tradition of Dutch landscape painting.

KEYWORDS Brazil, colonialism, Dutch East India Company, Dutch West India Company, Itamaracá, landscape painting, VOC, WIC.

Introduction

Frans Janszoon Post (1612–1680), a 17th century Dutch painter, is often credited to be the first to depict and hence give a European glimpse of the New World (Ducos 2005). Coming in the retinue of count Johan Maurits van Nassau-Siegen (1604–1679), governor-general of

 DOI 10.1080/03096564.2016.1246166

Dutch Brazil and arriving there in 1637, he was commissioned to draw and paint the young Dutch colony. He did so during the 7 years of his stay in the New World (1637–1644) and returned to the Low Countries carrying material that would prove to be of high documentary value. In his later career, he continued painting scenes inspired by his Brazil experience. According to van Groesen (2011) there is abundant literature about the 'humanist' period in Brazil under the rule of Johan Maurits, between 1637 and 1644. This period has also yielded extraordinary natural history documentation, which however needs further scrutiny.

Much has been written about both the painter Frans Post and his work, which is now spread all over Europe and beyond. Most famous are his Brazilian landscape paintings, several being conserved at the Louvre in Paris, after having been presented by Johan Maurits to the French King Louis XIV in 1679. Many of these were painted by Frans Post after his return to the Low Countries (van Groesen 2014). These colourful scenes are a varied and attractively painted rendering of a tropical environment, often studded with exotic elements, whether human, or regarding fauna and flora. Sugar mills give a glimpse of the prevailing sugar industry, and ruins of former Portuguese buildings, slaves and masters in apparent (socially layered) harmony tell a story of a productive new colonial society (Michalsky 2005, Sutton 2013), however with the ambivalence and the challenges which this colonial enterprise brought along (Oliver 2013).

Several authors have indeed stressed the idealizing rendering of a colonial and tropical setting, intended for a wealthy Dutch home clientele, partly from the imaginary and partly obviously based on sketches and earlier observation (Oliver, 2013). Hardship of life in the colony and the degrading aspects of slavery are not shown. The mixture of both, though having documentary value as regards elements of fauna and flora, has been considered to fit the political priorities of Dutch society. The Geoctroyeerde Westindische Compagnie (Dutch West India Company) was the chartered trading company behind the Brazilian colonial enterprise. Its view of an idealized yet lost colony (after 1654), sometimes either as a metaphor rather than as a precise location or as 'a Holland in Brazil' (Corréa do Lago 2006, Vieira 2012, Oliver 2013), is intimately associated with the pictorial products.

Viewing Post's work with the eyes of ecologists and geographers we were struck by the realistic landscape and vegetation rendering encountered in a painting made by Frans Post in the earliest phase of his Brazilian period, the *View of Itamaracá island in Brazil* from 1637 (fig. 1a). It is immediately clear that the colour palette of this painting made by Frans Post in Brazil, is comparable to the *Rio São Francisco* (1638), in the Louvre Museum in Paris, and also painted in Brazil. Both offer a naturalistic and much less idealized view of the landscape as compared to the post-1644 canvases described earlier, a 'landverkenning' (land reconnoissance) *sensu* Krempel (2006). Various authors have commented on the scenes in *View of Itamaracá island in Brazil* (1637), a presentation that is also considered very characteristic for the social relations in the young Dutch colony New Holland (Dutch Brazil). It is reported to show the colony's inhabitants in their respective hierarchical position, the scene possibly depicting their waiting for transport to Fort Oranje on the opposite river bank (Michalsky 2005).

Particularly striking is the very clear detail (fig. 1b) that we interpret as a forest of *Avicennia* sp., a mangrove tree species. Both its position at the water edge, in the

FIGURE 1A Frans Post, *View of Itamaracá island in Brazil*, 1637, oil on canvas, 62 cm × 89 cm (Mauritshuis, The Hague, Accession Number 915).

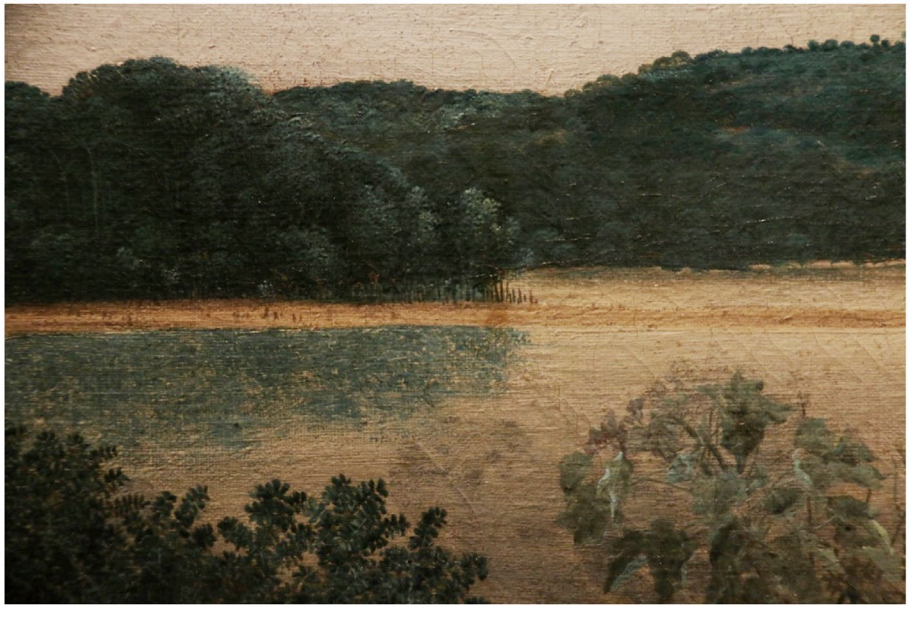

FIGURE 1B Frans Post, detail from *View of Itamaracá island in Brazil*, 1637, showing *Avicennia* sp., with pneumatophores (breathing roots, pencil roots), oil on canvas (Mauritshuis, The Hague, Accession Number 915).

FIGURE 2 Vegetation of the mangrove species *Avicennia germinans* near their northernmost limit in Mauritania (Parc National du Banc d'Arguin).

intertidal zone (Itamaracá has a mean tidal amplitude of *c*. 2m) and the pneumatophores, the pencil roots rising from the mudflat (a very recognizable adaptation in *Avicennia* spp. to the hypoxic substrate, cf. fig. 2), are unmistakable. Today, the environment of Itamaracá has a mixed mangrove assemblage comprising amongst others the tree species *Rhizophora mangle* L., *Avicennia schaueriana* Stapf and Leechman ex Moldenke and *Laguncularia racemosa* (L.) Gaertn. f. (Medeiros *et al*. 2001, Farrapeira 2008, Moura *et al*. 2009). Although the geomorphology of the area may have changed in some localities during recent times, due to human protective constructions such as seawalls (Medeiros

et al. 2001), historical and more recent cartographic evidence suggests that the general geomorphology very likely remained suitable for mangroves to establish throughout the centuries. Hence, there is no reason to believe that any other type of species assemblage existed in the 17th century or earlier, though through the dynamics of such systems species proportions can shift.

With the vegetation on the islet in the estuary of Post's *View of Itamaracá island in Brazil* (1637) (fig.1a), showing a mangrove forest, this is, to our knowledge, the first unambiguous depiction of this type of vegetation in the history of (European) art and hence probably of art altogether. Mangroves are woody plants that grow normally in tropical and subtropical latitudes (32.28° N for the northernmost limit in Bermuda and 38.45° S for the southernmost in East Australia, Quisthoudt *et al*. 2012) along the land-sea interface, bays, estuaries, lagoons, and backwaters. These plants and their associated organisms constitute the "mangrove forest community" or "mangal". The mangal and its associated abiotic factors constitute the "mangrove ecosystem" (Mukherjee *et al*. 2014). They consist of a fairly limited set of species (considering the species richness at respective latitudes in neighbouring terrestrial environments) of approximately 70 species of 17 families of plants (Polidoro *et al*. 2010). Many of these species have adaptations to the demanding environment, with high or changing salinity levels, hypoxia, flooding, and tidal dynamics. Most conspicuous are the root systems and propagules, *i.e*. the water-borne dispersal units of many species. Many mangrove assemblages worldwide are dominated by species of the specialized genus *Rhizophora*, with aerial stilt roots, or of the specialized genus *Avicennia*, with aerial pencil roots. Mangroves are now known to have crucial ecological roles in coastal ecosystems. These comprise shoreline protection and a major nursery role to marine and pelagic fauna, often species of interest for fisheries (Lee *et al*. 2014). Human coastal communities have relied on such ecosystem services and still do so in many countries worldwide. Recently, the carbon sequestration role of mangroves was reported to exceed similar functions by the much better known tropical terrestrial forests (Donato *et al*. 2011) when considered per unit area.

To a fresh observer like Frans Post, when arriving in Brazil, the respective root systems would have been the immediately most recognizable and quite unfamiliar feature of mangroves. Frans Post apparently had a keen eye to register this striking tropical coastal vegetation. Apart from the fact that the painters of the Low Countries set the scene in European naturalistic landscape painting, as witnessed by painters contemporary to Post in his home country (birth date ordered from 1585 to 1638: Hendrick Avercamp, Gerrit Claesz Bleker, Pieter de Molijn, Jan Josephszoon van Goyen, Salomon van Ruysdael, Philips Koninck, Aelbert Cuyp, Cornelis de Man, and Meindert Hobbema, amongst others), it may not be by accident that Post as a Dutch painter developed this keen eye for the landscape and its peculiar features. The Low Countries including Post's home town Haarlem were essentially marshes, ditches, canals, willow assemblages, estuaries and riverscapes, reminiscent of some of the background in Post's work (see for example *Fort Frederik Hendrik*, 1640, Instituto Ricardo Brennand, Recife; *Landscape with anteater*, 1649, Alte Pinakothek, Munich). Pieter-Paul Rubens (from the Southern Low Countries) in his well-known work *Pan and Syrinx* (1619, Staatliche Kunstsammlungen,

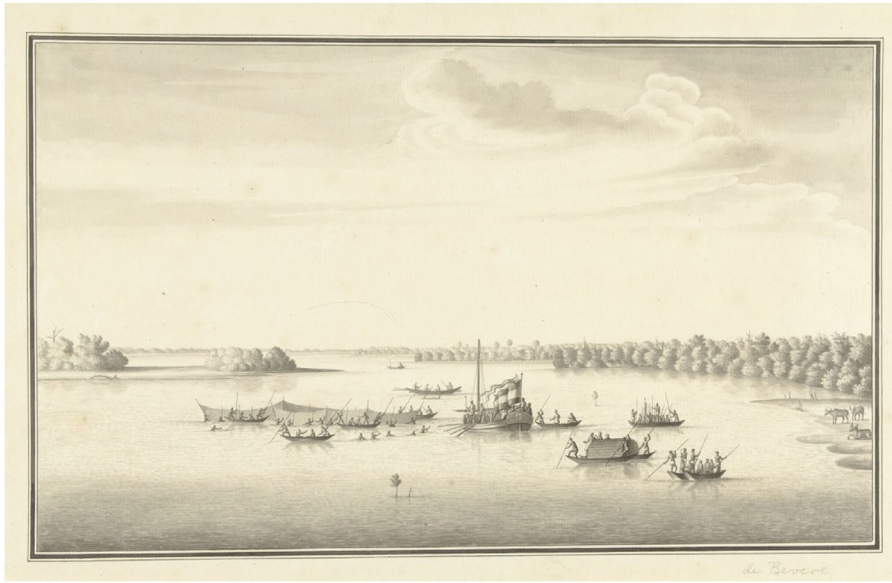

FIGURE 3 Pieter Cornelisz De Bevere, *J.G. Loten and his Company & C. fishing in the River of Nigombo in Ceylon*, 1754, pen and brush on paper, 21.2 cm × 34.5 cm, present day Negombo Lagoon, Sri Lanka (Rijksmuseum, Amsterdam, Accession Number RP-T-00-915).

Kassel, Germany) depicted in great realism a reedbed with astonishing botanical landscape-detail two decades before Post's 'Itamaracá', but focused on the mythological scene and botanical details rather than on the landscape and its features. The botanical details are relevant to the scene with reeds as a syrinx-construction material. However, none of the European marshlands look like mangroves and this may have caught the eye of Post.

One can wonder why, knowing the dependence of local communities on mangroves and on their services today and the unfamiliar sight of these marine forests, they have not left many more traces in early colonial painting, nor in later depiction of systems which obviously were bearing extensive mangrove forests at the moment of observation. A good example of this lasting neglect would be the various engravings and works of art showing the Dutch settlement of Negombo in Ceylon (trade posts and fortifications of the Dutch East India Company VOC, Negombo: 07°09' N; 79°51' E), which are entirely covered in mangroves today and would have been so in the 18th century. However, nothing unequivocally pointing at very striking mangrove forests (here mostly *Rhizophora* spp. with impressive stilt roots) has been shown by Pieter Cornelisz De Bevere in the drawing *J. G. Loten and his Company fishing in the River of Nigombo in Ceylon* from *c.* 1754 (fig. 3) or the coloured drawing *View on the Fort of Negombo* from 1753 (fig. 4) by an anonymous artist.

This, on the other hand can be explained by the fact that mangroves in spite of their importance to local communities had little or no relevance to a colonial and trading empire like the ones developed by the two companies, *i.e.* the Dutch East India Company

FIGURE 4 Anonymous, *View on the Fort of Negombo*, 1753, paper, 30 cm × 53 cm, present day Negombo Fort, Sri Lanka (Rijksmuseum, Amsterdam, Accession Number RP-T-00-3249).

(VOC) resp. the Dutch West India Company (WIC), both rooting in the Dutch republic. None of the mangroves' products presented any commercial interest, which could be exploited and traded. Wood needed for forts has been reported to be shipped from the Low Countries and wood encountered by the colonial enterprise in the marshy environment was considered unsuitable for solid constructions or inaccessible because of insecurity (Van Nederveen Meerkerk 1991, 2006). The wood was also described as difficult to be cleaved in an 18th century source (Hartsinck 1770).

This then aligns with the statement that much of Post's painting, certainly the post-1644 scenes, as well as works by his fellow painters, follow either a political programme and/or the customers' interest for the exotic and particularly the economically valued exotic elements (*e.g.* Erkan 2012). In spite of this, elements of naturalistic and scientific interest were also expressed in the 17th century Dutch painting (Teixeira 2006).

One may compare to Rumphius' botanical work, the most remarkable *Amboinsch Kruid-boek* (1743), a nature-historical (and soundly taxonomic) survey posthumously published in Dutch and Latin (Rumphius 1743, but dated earlier), on the island of Ambon, Dutch East Indies. It describes several mangrove species, their use, as well as their role in the local environment and for the local communities in much validated detail, but hardly of any interest for the colonial enterprise of the Dutch merchant republic. Rumphius was a German military engineer employed at the VOC (after also having intended in vain to work in Brazil for the WIC) and then continued as a publishing scientist almost 100 years after Post observed mangroves in Brazil. Though Rumphius had access to local knowledge and gives very detailed information on mangrove uses[1,2], none of them seem of any major trading interest and would not have attracted the company's lasting attention. Rumphius cross-refers to mangroves in the West Indies[3], showing the flow of

FIGURE 5 Frans Post, *Arx Archijn*, 1645, copperplate printing on paper, assigned to etcher Jan van Brosterhuisen, 40.5 cm × 51 cm, suggested to represent Arguin, present day Mauritania (Rijksmuseum, Amsterdam, Accession Number RP-P-1951-74).

scientific information, mainly through the Dutch republic. The lack of major trading interest also appears from Hartsinck's description of West-Indian mangroves (1770)[4], of congeneric species that are mostly comparable to Rumphius (*l.c.*). Hence the mercantile intentions of the observer or his patrons will also direct the painter's eyes, which makes Post's sharp observation of the common and unremarkable coastal vegetation in Brazil in the first half of the 17th century, remarkable.

If we try to trace Post's acquaintance with mangroves as unfamiliar tree types, we could consider how well the awareness of a particular type of marine forests was at the time. In 1594 André Álvares de Almada describes the mangrove forests of West Africa in his *Tratado breve dos rios de Guine* ('Brief Treatise on the Rivers of Guinea') with very recognizable words (Álvares de Almada 1594), *inter alia* mentioning that their size would make them good ship masts, if they were not so heavy (because of high wood density)[5]. The uses mentioned are again not very significant for mercantile interests. Contact between a Portuguese body of 'coastal knowledge' to Dutch observers (and later *vice versa*) is highly probable, in view of the permanent interaction between the two cultures. For the Indian Ocean colonial powers (and East India Companies) botanical and zoological information was considered 'classified' because of its potential to generate wealth in the respective home countries. However, in spite of this competitiveness and secrecy,

FIGURE 6 Frans Post, *View of I. Tamaraca*, 1645, copperplate printing on paper, 53 cm × 41 cm, present day Itamaracá (Teylers Museum, Haarlem, Accession Number KG 05103).

also scientific exchange and interaction took place. The posthumous publication date of Rumphius' work was reported to reflect its classified nature, but at the same time the work frequently cross-refers to other bodies of knowledge in contemporaneous sources (Barnard 2015, Kathirithamby-Wells 2015, Winterbottom 2015).

If Post's etching *Arx Archijn* from 1645 (fig. 5) indeed represents 'Argijn' (as suggested by the Atlas of Mutual Heritage, *i.e.* the island Arguin in the Banc d'Arguin, present day Mauritania: 20° 25'N; 16°37'W), there is a striking detail (fig. 5, small tree to the left of the fort). At that latitude there are no (mangrove) trees, the northernmost trees (which are mangrove trees, again of the genus *Avicennia*) indeed occur *c.* 80 km south of Arguin today (Dahdouh-Guebas & Koedam 2001). A West-African passage by Post has been suggested by Krempel (2006) which would allow for Post's direct observation of these shores. The latitudinal limit for mangroves may have changed over time, and in view of the tree's position on the shore and a hint of pencil roots, this etching may be another early mangrove representation, though this is somewhat doubtful in our opinion.

Less equivocal are two other etchings by Post: *View on I. Tamaraca* from 1645 (fig. 6) and *Caput S. Augustini* from 1647 (fig. 7). The first is the very same landscape as on Post's *View of Itamaracá island in Brazil* (1637) (fig. 1a), but with a wider perspective, showing Fort Oranje to the right. For the remainder, its natural setting is faithful to the (earlier) painting, in contrast to the staffage. Mangrove vegetation does not appear

FIGURE 7 Frans Post, *Caput S. Augustini*, 1647, copperplate printing on paper, 53 cm × 41 cm, present day Cabo Santo Agostinho (Teylers Museum, Haarlem, Accession Number KG 05123).

unequivocally on the islet middle left, as on the painting, but this is obviously due to the scale not allowing pencil roots to be etched proportionately. Johannes Vingboons' much later rendering of the same scene (1665), an aquarelle present in the National Archive at The Hague, emphasizes the mudflats or sandflat, but no longer shows any mangrove in a recognizable way. At that moment there was no Dutch access anymore to the scene in Brazil and the details have apparently been obliterated or considered irrelevant. On Post's 1645 etching *View on I. Tamaraca* mentioned above (fig. 6), he depicts a mass of plants that must be identified as *Rhizophora*. This is the other globally prevailing mangrove genus, with its stilt roots[6]. Possible confusion with other, terrestrial species is obvious through this terminology, as cross-reference between mangroves in a modern sense and non-mangroves with somewhat similar morphology or critical reference to such confusion can be found in 18th century documents (Rumphius 1743, Hartsinck 1770). Post depicted the presumed mangrove vegetation slightly above the high water line in our opinion. One might see typical remnants of former mangrove in the lower intertidal on the same etching. *Rhizophora* also seems to be shown prominently on the etching *Caput S. Augustini* (1647) (fig. 7), present day Cabo Santo Agostinho. In both cases they appear as open and somewhat degraded mangroves, typical for environments with strong human impact, such as landings. With a mean tidal amplitude of approximately 2m in Itamaracá, the vegetation shown could be partially water-covered at high tide,

FIGURE 8 Frans Post, *Parayba*, 1647, oil on canvas, 61 cm × 91.4 cm, present day João Pessoa (Teylers Museum, Haarlem, Accession Number KG 05112).

if indeed low tide is shown by Post. Then again, on the painting *View on Frederikstad* (1638, private collection) as well as on the etching *Parayba* from 1647 (fig. 8) which covers the same scene, presumptive pneumatophores of *Rhizophora* can be discerned, as was suggested by Teixeira (2006). It is remarkable that the two works, with about a decade difference, have different staffage and fauna. However, both putatively show mangroves, though not represented in exactly the same position in order to leave space for a canoe with two people in the etching.

We can wonder whether these elements, obviously marginal in Post's objective when making his final products, are mere exotic touches, as has been emphasized for elements in several of his paintings. We think this is not the case, since in other graphic material such as *Arx Principis Guilielmi* from 1647 (fig. 9), steep shores are shown, less conducive to mangrove development, and here Post shows no obvious and recognizable mangrove species[7].

In conclusion, we have, to our knowledge, reported the first reliable mangrove representation as vegetation, not as an ornament in a scene or as an exotic touch. Post's works show at least two mangrove tree species, from the genera *Avicennia* resp. *Rhizophora*, worldwide the most important mangrove genera. Both genera are geographically wide ranging, both ecologically strongly adapted and highly recognizable. It has been argued that Post represented the Brazilian environment in a politically oriented perspective (in the

FIGURE 9 Frans Post, *Arx Principis Guilielmi*, 1647, copperplate printing on paper, 39.1 cm × 50.5 cm, present day Afogados in Recife (Teylers Museum, Haarlem, Accession Number KG 05119).

widest sense), later even in a metaphoric, not even site-related framework (Oliver 2013). Though this may be true for much of his work, particularly after his return to the Low Countries, we have shown that Frans Post had a very sharp eye for his new environment right from the first year of his presence in the New World, and that as a Dutchman in a time that landscape painting strongly developed, he recognized particular features of a marshy environment, so different from the one he knew from his youth.

Terms of Use

Acknowledgments

We acknowledge the contribution and help offered by Marilia Cunha-Lignon (Universidade Paulista, S. Vicente, Brazil), Faye Cliné (Mauritshuis, the Netherlands), and the Rijksmuseum for the long-term loan of the painting 'View of Itamaracá island in Brazil' to the Mauritshuis. Further we gratefully acknowledge help by Tristan Mostert (Atlas of Mutual Heritage, the Netherlands), Martijn Zegel (Teylers Museum, the Netherlands). We thank Bert Vervloessem (Vrije Universiteit Brussel, Belgium) for his expert advice on 17th and 18th century Dutch vocabulary. We also wish to acknowledge the Leopold III fund, the FWO (Flanders Science Foundation) and FNRS (Fonds de la Recherche scientifique) which allowed one of us (NK) through its funding to perform research on mangroves in Mauritania in 2009.

Notes

1 "Van dit hout kan men niets hebben tot timmerhout bequaam, om dat het zo krom en quastig is, daarentegen geeft 't goed brand-hout, evenwel't vuur zo ligt niet vattende, als 't voorschreven Lalary hout."
"Of this wood nothing may be obtained as carpenter's wood, because it is bent and knotty, however it is good fuelwood, though it does not burn as readily as the Lalary wood described earlier."

2 "'t Hout van de eerste of witte zoorte is zeer gebruykelyk tot den scheeps-bouw, om ribben en kromouten daar van te maken, uyt deszelfs kromme takken daar uyt men dan de natuurlyke kromt naar een voorgestelt model kan hakken. Het is niet alleen durabel in zee-water, maar heeft ook die deugden, dat het niet ligt splyt, en de spykers trouwelyk houd."
"The wood of the first or white species is very commonly in use for ship building, to make ribs and knee timber, from the same curved branches from which the natural curving can be cut into a model. It is not only durable in seawater, but it also has the benefits of not cleaving, and that it holds nails very well."

3 "Mangle, waar van de Schryvers van West-Indië dikwils gewag maken, moet men voor een en 't zelfde, of immers voor een naaste zoorte van 't Oost-lndische Mangi Mangi agten; dog bemerk ik doorgaans by dezelve een abuys, dat zy 't Mangi Mangi niet veel weten te onderscheiden van de Varinga, om dat beyde de boomen van baare takken wortelen in de aarde schieten."
"Mangle, often mentioned by the writers of the West-Indies, must be considered to be the same species or at least very related to Mangi-Mangi in the East-Indies; however I notice with the same that they erroneously do not succeed in distinguishing the Mangi-Mangi from the Varinga, because both trees shoot roots into the soil from their bare branches."

4 "Eenige Indiaanen, zo als de Guaranos of Warouwen, die meest aan de Rivieren en Moerassen woonen, plaatsen, om van de Overstroomingen bevryd te zyn, hunne Hutten op de Mangles- of Mangrove Boomen, welke, gelyk wy nader zullen beschryven, in zout en zoet Water kunnen groeijen, en welker op de grond hangende Takken weder uitspruiten, zo dat de Bosschen van Mangrove Boomen dermaaten dicht en vast zyn, dat men op de Takken kan gaan, en Hutten bouwen."
"Some Indians, such as the Guaranos or Warouwen, who mostly live along rivers and swamps, places safe from inundation, their huts built on mangles or mangrove trees, which, as we will describe in more detail, can grow in salt and fresh water, and the branches of which hang on the soil and resprout, so that forests of mangrove trees are so dense and fixed that one can walk on the branches and build huts."
"Men heeft 'er driederlei soort van *Mangles* Boomen, by ons *Mangrove* of Duizendbeenen en by de Indiaanen *Courouda* genaamd, de zwarte roode en witte. De zwarte Mangrove groeit altyd aan den Zeekant of op de Boorden der Rivieren: zyn Schors, die tot Leertouwen gebruikt wordt, is zeer bruin, glad en buigsaam nog groen zynde, ter dikte van een Schelling; het Hout is van dezelfde Kleur als de Schors, hard, buigsaam en zwaar, ongemakkelyk te bewerken, en splyt moeielyk, en geeft gelyk alle zwaare Houten, een goeden brand; de Bladen zyn dun en glad, veel gelykende naar die van den Laurierboom. Deeze Boom is niet zeer hoog, zynde zelden boven de twintig of vyf en twintig Voeten lang, en dertien of veertien Duimen over het kruis dik; hy schiet veele Takken uit, die recht en zonder kwasten zyn, welker afhangende Toppen, nederzakkende, in den Grond of in het Slyk der Rivieren, Wortel schieten, en als nieuwe Stammen maaken, doch tevens een Bosschagie zo dicht

in malkanderen, dat men ligtelyk daar over kan gaan zonder Grond te raaken; kunnende één Boom zich somtyds wel vyf honderd schreeden ver uitspreiden. Ook schiet deeze Boom, boven de Grond, verscheide Wortelen, die zich in de Aarde hechten, waar door hy somwylen vier of vyf Voeten boven de Grond staat; zo dat de plaatsen, daar die Boomen groeijen, moeielyk te begaan zyn. Dezelve groeit schielyk, en bederft niet in het Water. Aan de gedachte Wortels is het dat de Oesters zich hechten: waar uit het Vertelsel is ontstaan, dat de Oesters aan de Boomen groeijen.

De *roode Mangrove*, schoon deeze aan de Stranden der Zee of by de Rivieren groeit, schiet echter geen Wortels in het Water gelyk de zwarte, is ook van onooglyker gedaante, hebbende kromme en kwastige Takken, die zich naar den Grond buigen en een goed gedeelte lands beslaan. De Bast is dun en graauw, glad als de Boom jong is, maar vol barsten als hy ouder wordt. Het Hart van den Boom is roodachtig,dat door kooken in het Water een schoone roode Kleur geeft, waar mede men Wol en Linnen kan verwen, doch is niet standvastig, ook is het Hout tot Timmerhout dienstig, zynde hard en zwaar, van een donker rood, fraai gevlamd. De Bladen zyn eirond, op het dikste acht of negen Duimen breed, maar aan het dunne eind, waar mede zy aan den Boom met een korte Steel zyn gehecht, niet meer dan vyf of zes Duimen; eerst uitspruitende zyn dezelve van een Vleeskleur, zeer zacht en teder, doch ouder wordende van boven een aangenaam groen van onder eenigszins bleeker. Hy bloeit en draagt eens in 't jaar Vruchten: voor dat hy bloeit, even als de Wyngaard, kleine trosjes uitschietende, waar aan kleine Kerns komen, die als zy open gaan, een witte Bloessem geeven, van een aangenaamen Reuk. De Vruchten gelyken naar groote Druiven, groot vier Lyn over het kruis, in 't eerst groen, maar ryp zynde Violet van Kleur. De *witte Mangrove* groeit tot een redelyke hoogte en zonder kwasten, mede aan de kanten van het Water, waar over zyne Takken zich uitspreiden, die, als zy de Aarde raaken, ook de gemelde eigenschap hebben, van aldaar Wortel te schieten, als gezegd is. De Bast is bruin, en niet dikker dan een Gulden, onder welken nog een dunne witte Huid wordt gevonden, waar van de Indiaanen lange Draaden trekken, daar zy Touwen, Netten en Hamakken van maaken. Het Hout is wit en, nog groen zynde, zeer buigsaam, maar droog wordende broos en ligt, van binnen vervuld met een Merg als de Vlierboom. De Bladen zyn byna rond drie of vier Duimen over het kruis, zeer glad, teder en zacht. Tweemaal 's jaars brengt deeze Boom geele Bloemen voort, van gedaante als Tulpen, maar veel grooter, doch geeft geen Vruchten. Men vindt op de Bergen nog de zwarte en geele Mangrove."

"There are three species of *Mangles* trees, which we call *Mangrove* or Thousand legs and with the Indians the black, red and white named *Courouda*. The Black mangrove always grows at the seaward side or along the river banks: its bark, which is used for rope tanning, is very brown, smooth, and pliable, and when green, as thick as a shilling; the wood is of the same colour as the bark, hard, pliable and heavy, difficult to shape and to cleave, and has like all heavy woods, a good burn; the leaves are thin and smooth, much alike the Laurel tree. This tree is not very high, seldom above 20 or 25 feet tall, and 13 or 14 thumbs across thick; it has many branches that are straight and without knots, with hanging tips, sinking in the soil or the river mud and take root, and if they make new stems, but also a shrub so tightly together, that we can slightly walk over it without touching the floor; a single tree can sometimes stretch 500 steps. This tree also makes roots above the soil, which anchor in the earth, raising it sometimes 4 or 5 feet above the soil, so that places where the tree grows are difficultly accessible. On the roots considered oysters attach: resulting in the tale that oysters grow on trees.

The *red Mangrove*, despite growing at the coastal beaches or by the rivers, does not make roots in the water such as the black one, is also of a different habit, has curved and knotty branches that bend down and occupy a fair part of the land. The bark is thin and grey, smooth in young trees, but full of fissures when it grows old. The heart of the tree is reddish, that after boiling in water gives a beautiful red dye with which wool and linen can be dyed, however, it is not persistent, also the wood can be used as timber, being hard and heavy, of a dark red nice flame. The leaves are oval, the thickest being 8 or 9 thumbs wide, but at the thin end, with which it is attached to the tree with a short stalk (petiole), not more than 5 or 6 thumbs; when emerging they are flesh-coloured, soft and tender, yet older (leaves) become of a pleasing green, yet slightly lighter at the lower surface. It flowers and fruits once a year: before it flowers, like a grapevine, it shoots small racemes on which small buds appear, that upon opening reveal a white blossom, of pleasant smell. The fruits resemble large grapes, four lines across first of green, but when mature of violet colour.

The *white Mangrove* grows up to a fair height and without knots, also at the sides of the water, over which branches extend, which, if they touch the earth, also have the already mentioned characteristic of taking root. The bark is brown, and not thicker than a guilder, under which one can find a white skin, from which the Indians extract long fibres to make ropes, nets and hammocks. The wood is white and, when green, very pliable, but when dry brittle and light, at the inside filled with marrow like in the Elder tree. The leaves are almost round 3 or 4 thumbs across, very smooth, tender and soft. Twice a year this tree brings forth yellow flowers, of a tulip aspect, but much larger, however no fruits. On the mountains we also find the black and yellow mangrove."

5 "Na entrada deste Rio, vai sendo assim de huma banda como da outra a terra chãn, mas toda coberta de muito arvoredo de mangues, tão altos e grossos que, se não for a páo tão pesado, podião fazer delles mastos para navios de bom porte, e outros páos de muito boa madeira forte, de cores, adamascados e vermelhos, que lá chamão de Carvão. Estes mangues chegão até onde chega a maré da agoa salgada e, ali acabão."
"At the entrance to this river, the land on each side is flat but completely covered with a thick forest of mangroves, trees so tall and so thick that if their wood were not so heavy they could provide masts for ships of large tonnage. And there are other trees that have very good and hard wood, in colour apricot or red, called there charcoal-wood. The mangroves extend (inland) to the tidal limit of salt water, and there they stop."

6 Sometimes called 'wortelboom' in old yet later Dutch texts (Teenstra 1835) and in Dutch-derived Afrikaans or with the expression 'duizendbeenen', thousand legs as in Hartsinck (1770).

7 They would have occurred and still occur in the vicinity in view of the general geomorphology and topography.

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Notes on contributors

Nico Koedam is Professor of Biology at the Vrije Universiteit Brussel in Belgium. Since the early 1990s most of his research focuses on mangroves. With doctoral and postdoctoral collaborators his research group covers a wide range of topics and approaches from mangrove physiology to mangrove spiritual values in coastal societies. Most of his published work relates to East Africa and Sri Lanka, but Nico Koedam has also been active in West Africa, Vietnam, the Caribbean and several other mangrove areas. As a side track he has a strong interest for cultural aspects in biology and generation of transdisciplinary knowledge and particularly for the sixteenth and seventeenth centuries in the Low Countries.

Correspondence to: prof. Nico Koedam, Laboratory of Plant Biology and Nature Management, Ecology and Biodiversity, Vrije Universiteit Brussel (VUB), Pleinlaan 2, B-1050 Brussels, Belgium. Email: nikoedam@vub.ac.be

Farid Dahdouh-Guebas is Professor of Biology at the Université Libre de Bruxelles (ULB) in Belgium. His mangrove work started at PhD and postdoctoral at the sister university Vrije Universiteit Brussel. At the ULB he developed a strong research group, also covering new research areas such as Malaysia and China, besides the regions of common activities between VUB and ULB. He and Nico Koedam continue to work together and share interest in information which often remains unrevealed in archives, such as in those of

the respective Dutch India companies. Archived data have been referred to in several of his publications, particularly for Sri Lanka/Ceylon.

Robert Lima Barcellos is an associate professor at the Universidade federal de Pernambuco. Robert was trained as a geographer, he is now engaged in oceanography. Related to his research activities in geochemistry and sedimentology, he is very knowledgeable about the Brazilian coast and shared the interest of his co-authors in historical aspects of this vast region. His field knowledge contributed as a validation of retrospection on basis of Post's work.

Tom Van der Stocken is a postdoctoral researcher at the Vrije Universiteit Brussel, Belgium. He was trained as a physical geographer and specialized in mangrove ecology, dispersal and biogeography. Oceanographic modelling, elucidating patterns of ocean currents responsible for mangrove seaborne dispersal was the latest development he embarked on, in collaboration with Dimitris Menemenlis (JPL NASA) in the USA. With the co-authors of this paper he enjoyed working on the cultural interface of the biological and geographical sciences and he contributed with his knowledge on history of art.