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# Essays on the history of Brazilian dipterology. II. Notices about Brazilian Diptera (17<sup>th</sup> century)

Nelson Papavero<sup>1,3</sup> & Márcia Souto Couri<sup>2,3</sup>

<sup>1</sup>Museu de Zoologia, Universidade de São Paulo, Caixa Postal 42494, 04218–970 São Paulo-SP, Brasil. nelson.papavero@pq.cnpq.br

<sup>2</sup>Museu Nacional, Universidade Federal do Rio de Janeiro. Quinta da Boa Vista, s/n°, 20940–040 Rio de Janeiro-RJ, Brasil. courimarcia@gmail.com

<sup>3</sup>Bolsista de Produtividade Científica, Conselho Nacional de Desenvolvimento Científico e Tecnológico (CNPq)

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**ABSTRACT.** Essays on the history of Brazilian dipterology. II. Notices about Brazilian Diptera (17<sup>th</sup> century). Notices from the Brazilian Diptera from the 17<sup>th</sup> century come mainly from two foreign invasions occurred in Brazil, the first one by the French in Maranhão and the second by the Dutch in northeastern Brazil. This paper includes reports of Fathers Claude d'Abbeville and Yves d'Evreux and from Piso and Marcgrave, the last two presenting the first illustrations of Brazilian Diptera. The paper also includes reports of Friar Laureano de la Cruz, Father João de Sotto Mayor and Maurício de Heriarte.

**KEYWORDS.** Brazil; Dipterology; History; 17<sup>th</sup> century.

**RESUMO.** Ensaios sobre a história da Dipterologia brasileira. II. Notícias sobre os dípteros brasileiros (século XVII). Notícias dos dípteros brasileiros datadas do século XVII são provenientes principalmente de duas invasões estrangeiras ocorridas no Brasil, a primeira pelos franceses no Maranhão e a segunda pelos holandeses no nordeste do Brasil. Este artigo inclui uma súmula dos relatos dos padres Claude d'Abbeville, Yves d'Evreux e de Piso e Marcgrave, esses últimos consistindo nas primeiras ilustrações de dípteros brasileiros. Inclui ainda relatos de Frei Laureano de la Cruz, Padre João de Sotto Mayor e Maurício de Heriarte.

**PALAVRAS-CHAVE.** Brasil; Dipterologia; História; século XVII.

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In 1578 the King of Portugal, Dom Sebastião, died in the battle of Alcácer-Quibir. Having no heirs, he was succeeded in the throne by his great uncle, the cardinal Dom Henrique, who died in 1580. This was the end of the Dynasty of Avis. The government of Portugal passed to the hands of Philip II of Spain, establishing the so-called Union of the Iberian Crowns. Spanish domination of Portugal lasted for 60 years, ending in 1640, when Portugal separated from Spain and the Duke of Bragança became King Dom João IV, initiating the Dynasty of Bragança.

During the Union of the Iberian Crowns, two main foreign invasions occurred in Brazil. The French occupied the island of São Luís (Maranhão), from 1612 to 1615, when the Portuguese from Pernambuco defeated them. From 1630 to 1654 the Dutch invaded northeastern Brazil. On the other hand, this period had its advantages – as the Treaty of Tordesilhas was no longer valid, since Spain and Portugal formed only one country, the Portuguese, after the foundation of the city of Belém in 1616, started the colonization of the Amazon valley, considerably increasing the area of Brazil in the following centuries.

**The French invasion of Maranhão. Fathers Claude d'Abbeville (1614) and Yves d'Evreux.** For a short history of the invasion of Maranhão by the French and about fathers Claude d'Abbeville and Yves d'Evreux, see Chiqueri *et al.* (2011: 82–85) and Papavero *et al.* (2002: 95–98). d'Abbeville (1614: 255r, 255v) commented about the Diptera of Maranhão:

*“Il y a des Mouches que les Indiens appellent Merou ou Berou: il s'en trouue de diuerses especes, mais toutes differentes des nostres. Le Moutouc est vne autre espece de Mouches fort grosses & belles à voir. Marigouy ou Maringouin sont petits Mouchérons gueres plus gros que pointes d'espingles, qui mordent bien fort, & leur morsure vous demange en telle sorte que vous auez bien de la peine où ils vous ont mordus, ils demeurent ordinairement dedans les Apparituriers le long des riuages de la Mer. Yetingue est encore vne autre espece de Moucheron, vn peu plus gros que les Marigouy. Iation est vne autre espece de Mouche, qui a le nez long, fort semblable à celles de France que nous appellons Cousins: elles font sortir le sang du lieu où elles vous piquent; ordinairement elles sont le long des riuieres, & sont plus communes pendant la saison des pluyes qu'en autre temps. Les Merou Oubouyh sont Mouches toutes vertes semblables aux Cantarides [sic!] que nous auons en France”.*

[There are flies called by the Indians Merou or Berou: there are several species of them, but all of them different from ours. The Moutouc is another species of flies very large and beautiful to see. *Marigouy* or *Maringouin* are very small flies scarcely larger than the tip of a needle, which bite very strongly, and their bite hurts you in such a way that you really suffer where they have bitten; they ordinarily live in the mangroves along seashores. *Yetingue* is also another species of small fly, a little larger than the *Marigouy*. *Iation* is another species of flies, which has a

long nose, very similar to those of France that we call *Cousins*: they cause the blood to pour out of the place they have bitten; they ordinarily live along rivers and are commoner during the rainy season than in any other weather. The Merou Oubouyh are entirely green flies similar to the cantharids that we have in France].

These are respectively, in French rendering, the Tupi names for flies in general (muscoïds especially), tabanids, ceratopogonids, chloropids, culicids and *Cochliomyia* (Caliphoridae – *mberu obi* + green or blue (*obi*) fly (*mberu*)).

These comments by d'Abbeville were reproduced in the several editions of Jan de Laet's book on the New World (Laet 1625, 1633, 1640; see also Chiquieri *et al.* 2011).

Father d'Evreux (1864: 185–186) made interesting remarks about the spontaneous generation of mariguis and the ways both Indians and Frenchmen tried to avert them in Maranhão:

*“Il y a en ces pays diuerses especes de Mouchérons, mais ie me veux seulement arrester à ceux qui meritent d'entrer en la consideration de l'esprit humain, à cause des principes naturels qui se recognoissent en iceux, & ceux-cy sont appelez par les Sauuages Maringoins: entre lesquels il y a de la diuersité en grosseur & grandeur, mais non en forme ny en propriété. Ils naissent tous d'une humeur acrimonieuse, & ayment les saueurs aigres & aiguës, & non les douces: Pour cette cause la mer et ses bordages en sont farcies durant les pluyes & procedent de l'humeur de la mer, & vapeurs d'icelle. Ils sont fort molestes aux hômes, leur perçant la peau avec leur bec pointu comme vne éguille, & en succent l'humeur salee qui court entre la peau & la chair. Ils ayment la lumiere: mais ils craignent la flambe & la fume, tellement qu'aussi tost que la nuict est venuë, ceux qui demeurent dehors s'accrochent sur les feuilles des arbres: Quant à ceux qui sont dedans les Loges, ils s'attachent la nuict sur la couverture du Toict, à leur grand regret, à cause des feux que les Sauuages fõt autour d'eux, par le moyé de la flâbe & de la fume. Plus vous estes proches de l'eau, plus vous abõdez en cette vermine par ce que leur origine est specialement des eaux, ainsi que nos auons dit. Ils seruent de venaison aux Chauue-souris, lesquelles les attrapent dans leurs aisles, frayans le lieu où ils sont attachez, puis les mangent, approchans leurs aisles de leurs bouches, dans lesquelles ces gros Maringoins sont enueloppez. Nos François qui vont à la pesche des Vaches de mer, sont infinimêt tourmentez de ces bestioles, & sont contrainct de pendre leurs liets de Coton aux branches des arbres le plus haut qu'ils peuuent, pour éuiter leur importunité, à cause de l'air & du vent qui souffle dauãtage au haut des arbres qu'au dessous, si les cordes rompoient ils feroient vn beau sault, & ne cessent de bransler, pour faire fuyr d'autour d'eux ceste vermine”.*

[There are in this country several species of small flies, but I want to restrain myself to those which deserve to

enter into the consideration of the human spirit, because of the natural principles recognized in them, and these are called by the Savages Maringoins: among which there is diversity in volume and length, but not in shape nor in property. They are all born from an acrimonious humour, and love the bitter and acute flavors, and not the sweet ones: Because of that the sea and its shores are replete with them during the rains and they proceed from the humour of the sea, and the vapors of it. They are quite a nuisance to men, piercing the skin with their beak as sharp as a needle, and suck the salty humour that flows between the skin and the flesh. They love daylight: but are afraid of flame and smoke, so much so that, as soon as night comes, those living in the open grab themselves to the leaves of trees: As to those inside lodgments, they grab themselves during the night to the covering of the ceiling, to their great regret, because of the fires that the Savages make around themselves, to avoid their bites during the night, by means of flame and smoke. The more you are near the water, the more you have plenty of this vermin, because they owe their origin especially to the water, such as we have said. They serve as food for the bats, which capture them in their wings, rubbing the place to which they are attached, and afterwards eating them, approaching their wings to their mouths, in which the *Maringoins* were enveloped. Our Frenchmen, when they go to fish cow-fish [*Trichechus manatus* Linnaeus, 1758, Trichechidae, Sirenia], are infinitely tormented by these small beasts and are constrained to hang their cotton hammocks in the branches of trees, as high as they can, because of the air and the wind that blow more at the top of the trees than below them; if the ropes break, they would made a beautiful somersault and they do not cease to swing [their hammocks] in order to avoid these little beasts around them].

Once more there is confusion between *mariguis* and culicids, the latter being implied in the passages dealing with means of avoiding their bites.

**The Dutch in Northeastern Brazil. Piso (1648, 1658) and Marcgrave (1648). The first illustrations of Brazilian Diptera.** In 1637 Count Johan Maurits van Nassau-Siegen arrived in Recife, Pernambuco, as Governor of the Dutch domains in northeastern Brazil. A typical Renaissance man, he brought with him two scientists, Piso and Marcgrave, who would publish in 1648 the first scientific books about the Natural History of Brazil. Those books would be the main source of information about the Brazilian biota for the next two centuries. Moreover, the Count was surrounded by artists, among them Frans Post and Albert Eckout, responsible for a wealth of paintings and drawings, representing landscapes, human types, animal and plants of northeastern Brazil. The fate of those drawings was described by Teixeira (1995a: 146–147): “In 1644, misunderstandings with the West Indies Company resulted in the return of Maurice van Nassau

to Holland after a 7 years stay in Brazil. Amongst the treasures taken back to Europe on that occasion, was a great number of portraits, loose paintings, sketches and drawings concerning Natural History, done by the artists who had accompanied the Prince to the New World. In 1652, a considerable part of this collection was to be granted to Frederick-William, Elector of Brandenburg, in exchange for certain noble titles and land in the proximity of Cleves. Included in the Elector's private collection in Berlin, this material contained water-colours and sketches bound into two volumes known as 'Libri Principis' or 'Manuals', as well as numerous paintings and sundry crayons. Between 1660 and 1664, the last two items mentioned would be gathered by Christian Mentzel, Frederick William's private physician, into the four folios of the 'Theatrum rerum naturalium Brasiliae'. However, one presumes that a few originals remained in Mentzel's legacy, being finally compiled together with various other illustrations in a small book called 'Miscellanea Cleyeri', that would reach the library only in 1757. Later, all seven volumes containing the images of Dutch Brazil were in turn included in a series of illustrated manuscripts known as 'Libri Picturati', comprehending nothing less than 144 different tomes, where the four folios of the 'Theatrum rerum naturalium Brasiliae' were numbered A32-A-35, the two volumes of the 'Libri Principis' were numbered A36-A37, and the 'Miscellanea Cleyeri' was numbered A38. The originals on Dutch Brazil would be transferred from the Elector of Brandenburg's private collection to the Royal Library ('Königlichen Bibliothek') and then to the Prussian Library ('Preussischen Staatsbibliothek'), where they would remain until the middle of the twentieth century. (...) [They were] finally removed from Berlin in 1941 together with the Prussian Library collection, according to the policies of the famous 'quadriennial plan' of 1937, carried out by Hermann Goering. In the process, the 'Libri Picturati' were divided into two parts, one being sent to a Benedictine monastery in Beuron, high Danube, and the other to Schloss Furstentein (now Ksiasz) in Silesia. Containing images of Dutch Brazil as well as several manuscripts of famous authors, this consignment would once again be transferred in 1943 to the not so far village of Grussau (now Krzeszów), remaining hidden in Saint Joseph's Church until it was rediscovered and transferred to the Jaguelonian Library of the Cracow University between 1946 and 1947". Most of those drawings of animals and plants served as the basis for the somewhat crude woodcuts included in the works of Piso and Marcgrave. Some volumes of their books had the woodcuts painted by hand.

A fact frequently omitted in the literature about the history of entomology is that the works of Piso and Marcgrave represent the third oldest publications including illustrations of insects, some of them drawn with the help of a microscope. They are only anteceded by the drawings of a bee by Stelluti (1625, to accompany the *Apiarium* of Cesi (1625); reproduced in Stelluti 1630) (cf. Ball 1965; Egerton 2004; Guardo 2004 and Singer 1953) and Hodierna's (1644) figures of the eye of a fly. Piso and Marcgrave antecede the works

of Hooke (1665), Redi (1668), Malpighi (1669) and Swammerdam (1675, 1682, 1695, 1737-1738); they are simply not mentioned, for instance, in Meli's (2010) paper on the representation of insects in the sixteenth century.

In his *Medicina brasiliensi libri quatuor* Piso (1648: 38-39) wrote about mosquitoes:

"*Moscites Lus. Bras. Mariguè.*

*Aliud porro genus datur vermiculi alati nigrum, adeoque parvum, ut tactus sensii potius quam visus percipi soleat. Culicum more gregatim volitant. Nunquam apparent nisi summa existente malacia, idque vespertino tempore potissimum, circa fluviorum ripas inter paludosas illas arbores Mangues dictas, haerent. Merito ab omnibus pariter incolis extimescuntur haec insecta molestissima; quippe adeo exercent & lancinante agricolas, ut non solum membra eorum nuda, sed & leviter vestita morsu doloroso infestent, acuumque mucrones referant. Scapha fluvium lento gradu ascendentibus mecum Hispanis, adeo intumuerat, viscusque ac rubore conspersa erat nobis facies, ut à familiarissimis ne quidem dignosceremur amicis. Aethiopem jussu domini sui palo affixum, perque integram noctem (mirum supplicii genus) relictum, postridie delitio captum, ex meris doloribus, memini. Peregrinantes per deserta densaque Brasiliae nemora, quo defatigata aura marina vix pertingit, praesentiosem cautelam non amplectuntur, quam ipsum ignem integrosque rogos: tum quoque balsamum Copaiba & Cabuberiba, quibus membra nuda inungunt. Ante horam unam atque alteram, humores & puncturae evanescere solent, modo non nimia frictione frigidae aspersione irritentur partes laesae. Dolores apprime sedantur mucagine cardui littoralis, tum & herba Pagimirioaba & Imbauba, caeterisque ejusdem generis succis inspissatis, quae frigida & anodyna qualitate pollent"*

[*Moscites* [i. e., mosquitos] Portuguese. Mariguè [i. e., mariguais] Brazilian.

There is another genus of small, winged worms, black and so small that ordinarily the sense of touch perceives them before that of vision. They are gregarious like the mosquitoes. They only appear when the air is still, especially in the evening; they sit, near rivers, on the swampy trees called *mangroves*. These very obnoxious insects are equally feared by all the inhabitants, because they assail and bite the planters not only to the point of attacking them with painful bites on the naked members, but also through light garments, reminding one of points of needles. In a canoe in which some Spaniards were slowly going up a river with me, our faces became so swollen and filled with boils and ardor, that we weren't recognized by our friends. I remember a negro tied to a pole by his master's order, and abandoned there for an entire night (a frightful gender of torture), who was taken by delirium the following day due to the effect of the pains. Those who travel to the interior and the dense forests of Brazil, where the sea breezes only arrive already attenuated, have the most immediate recourse in fire and great campfires;



and also in the *Copaíba* and *Cabureíba* balsams, with which they anoint the naked members. After one and a half hours tumours and punctures ordinarily disappear, as far as the harmed parts are not irritated by excessive frictions or aspersions of cold water. The pains are principally mitigated with the mucilage of seashore thistle [or cactus?] and also of the herbs *Pagimirioba* and *Imbaúba*, and other thick juices of the same kind, endowed with frigid and anodyne qualities].

Piso cited in this passage some of the plants traditionally used by the Indians to mitigate the pains inflicted by hematophagous dipterans. *Copaíba* is the name of several species of the genus *Copaifera* (Fabaceae); *cabureiba* is *Myrocarpus frondosus* (Fabaceae); *pagimirioba* was a name (now disappeared) given by the Indians to *Senna occidentalis* and *Senna tora* (Fabaceae); *imbaúba* is applied to several species of the genus *Cecropia* (Urticaceae).

The absolutely barbarous torture of a negro slave referred to by Piso had also been practiced by Spaniards, as told by Rogers (1916: 185): “The habit of torturing Indians and Africans had hardened Spanish hearts. Drake [16th century] found a negro who had been sentenced to be whipped raw, set in the sun, and tortured to death by mosquitoes. An Indian was smeared with brimstone, fired, restored to health, anointed with honey, chained to a tree ‘where mosquitoes flocked about him like moats in the sun and did pitifully sting him’”. This sad episode inspired a passage in Shakespeare’s *Cymbeline* (cf. Papavero *et al.* 2010: 163, note 9).

In his book *Historiae rerum naturalium Brasiliae* Marcgrave (1648: 253) published for the first time the description and an illustration of a dolichopodid, naming it *Culex elegans*:

“*Culex paulo major vulgaribus tinnulis, hic reperitur, elegantissimi coloris: crura habens sex máxime exilia brunni coloris splendentis, raris pilis hirsuta: caput rotundum, in duas partes veluti fissum, superiusque ex viridi elegantissimus aureus color resplendet ad latera purpurascens. Posterior corpus desinit in aculeum satis longum, superius ex viridis elegantis aurei coloris, & pilis raris irsutum: habetque quinque juncturas subnigricantes: alas duas tenues, satis longas, iridis colores repraesentantes, imo superantes: in capite cornicula duo: sed haec omnia tantum per megascopum observari possunt*” (Macgrave 1648: 253).

[*Culex*. Here is found a mosquito larger than the normally buzzing ones, of a very elegant colour. Its legs, six in number, are very slender, of a lustrous dark colour, covered with some rare hairs; its head is round, and as if divided into two parts; in the upper part a golden-green colour predominates, being purple at the sides. The upper part of the body ends into a very long sting, of a golden-green colour above, covered with some scant hairs, and composed by five somewhat dark rings. The wings, two in number, are very long, reproducing, and even more vividly, the colours of

the rainbow; in the head two small horns are found, which can only be observed by means of a megascope].

The same coloured drawing of a dolichopodid appears in the *Libri Principis*, wrongly labeled “Mutúca” (tabanid) (cf. Teixeira 1995b: 162); a copy of his plate also exists in the collection of plates by an anonymous author entitled *Animaux et Oiseaux* (in the Kupferstich-Kabinett, Dresden, no. Ca 221; cf. Teixeira 1998: 135) and in plate 86 of the *Thierbuch* of Zacharias Wagener (cf. Teixeira 1997: 149), simply called “Mosca” (fly). All of these works date from the 17th century.

Marcgrave’s reference to a megascope is baffling. It could refer to a simple magnifying lens (as suggested by the above text) or to a real megascope, as could be inferred from the sentence at the end of his description of the “nhativ” (see below): “Icon per megascopium fuit delineate” (The image was delineated by means of a megascope). Brewster (1832: 765) said that “The name of megascope has been given to the camera obscura, when employed to represent, or to take copies of objects placed in front of the window, or of the lens in the portable camera obscura, and a short distance from it. In this case, the image is generally received at a distance from the lens greater than that of the object; and is consequently very much intensified. By altering the distance of the object, the size of the image may be increased or diminished at pleasure; and when the object does not reflect much light, we have it in our power to illuminate it artificially. *The megascope may be made to magnify so much as fifteen times with much advantage, and is an instrument of very great use in taking correct outlines or representations of natural objects, which, from their smallness or other causes, are not susceptible of being submitted to exact mensuration. The megascope may even be employed for copying any plans or drawing on an enlarged or a reduced scale* [our italics]”. However, according to Jones (1974: 33–34): “In the aphengoscope or opaque lantern, also sometimes called the **megascope** [emphasis ours], the images are projected upon the screen by reflection instead of by transmitting the light through transparencies. The first magic lantern of this nature appears to have been invented by Euler, the mathematician, and was described in his ‘Letters to a German princess’. In his letter to her of January 8, 1762, he gives diagram A (Fig. 1), and says that he had the honor of presenting her with one of the lanterns six years previously. The object to be optically projected was placed in the back of the lantern at B and opposite it in a sliding tube in the front of the lantern was the projection lens A. It contained two side wings, with lamps and mirrors to illuminate the object. (...). Prior to Euler’s invention it seems that the rays of the sun were used to illuminate an object the image of which was then thrown upon a screen”. From this somewhat confuse text, we may probably gather that the megascope already existed before Euler presented one to the German princess in 1756. It is therefore probable, but obviously a speculation, that such an instrument, or something much like it, an adaptation of Athanasius Kircher’s *lanterna magica* invented by him in

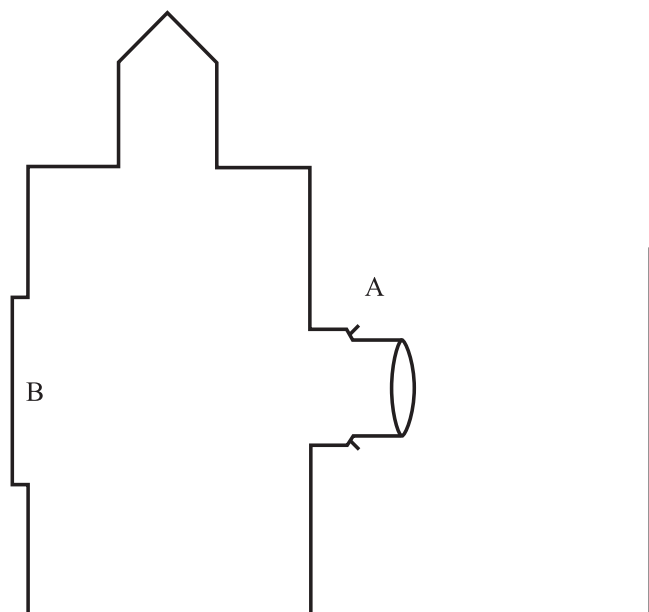


Figure 1. Euler's diagram of a megascope (aphengescope) (modified from Jones 1974: 33).

1626 ("The *magic lantern* is simply a portable megascope, in which transparent objects are illuminated by the light of one or several lamps" (Farrar 1826: 207), was in existence in the Netherlands, then one of the richest and cultured countries in Europe, and that some artist from Nassau's entourage used it in Recife to make, among others, the drawings of a dolichopodid and a mosquito published in Marcgrave's *Historia naturalis* in 1648. And that putative megascope must have been very efficient, because, for that time, the drawings are remarkably well done. After all, the microscope had been invented in the beginning of the sixteenth century; Leeuwenhoek constructed his own lenses and microscopes and from 1673 on he wrote letters to the Royal Society of London describing his amazing discoveries. Optical instruments were well developed in the Netherlands. This is a subject that should deserve further researches by specialists in the history of Dutch science and technology.

Marcgrave (1648: 257) also talked about culicids, publishing the first illustration of a Brazilian one:

"*NHATIV Brasiliensibus, Mosquito pernilongo Lusitanis, Langbeen Belgis: culex est tinnulus parvus:capitulo obrotundo, cui duo cirrhi paululum incurvati adstans; ad quemlibet nimirum oculum longus est cirrhus. Pilis longis ab utroque latere, ordine decoratus, usque ultra medietatem, muscarii modo, extremas pilos breviusculos habet. Corpus ellypticum, sex habet crura, longa, tribus internodiis constantia, ultima sectio teres, longissima: in extremitate longo rostillo sanguinem exsugit: alae illi duae in postica parte mediae sectionis. Totum insectum vestitur pilis subtilibus brevibus flavescentibus. Media sectio nigra, variegata maculis obscure flavis; ultima obscure flava, undata nigro, annulorum fere modo, & ubi intestina,*

*longiores habet pilos. Caput nigrum flavo mixtum. Rostrum com finis cirrhis punctulatum nigro obscure flavescit. Cirrhi reliqui duo pilosi pallide flavi cum pilis, & cirrhi ipsi punctula nigra ordine posita continente. Insectum admodum frequens noctu in palustribus ut & maritimis locis, pungit acerrime, etiam per linea vestimenta & maximum pruritus excitat; molestiam simul summam parit tinnula sua voce. Multas saepe noctes insomnes egi hujus insecti causa: nec igne nec alia re abigi potest unicum remedium habetur, sed non ita proficuum, ut accendatur fimo bibulus siccatur, cujus fumus paulum arcentur. Icon per megasopium fuit delineata.*

*ANNOTATIO. Quidam ajunt hoc insectum à Brasilianis vocati Yatium, gignit autem haec regio & aliud culicum genus ignavum & mansuetum, quamvis hominibus valde importunum, at nullo mucrone armatum, vocant Ietingae. Item aliud quod marigui vocatur, minutissimum quidem sed tam crudeliter homines affligens ut vix tolerari possit"*

[NHATIÚ of the Brazilians, *Mosquito pernilongo* of the Portuguese, *Langbeen* of the Flemish. It is a small, buzzing mosquito, with round head, to which are attached two somewhat curved cirrhi; that is, next to each eye a long cirrhus is found, conveniently ornamented with long hairs, in both sides, up to beyond the middle, similar to a horse's queue; the tip, however, has shorter hairs. The body is elliptical, with six long legs and composed of three parts; the last section [abdomen] is rounded and very long. At the [anterior] tip, by means of a long and little beak, it sucks blood; at the extreme part of the median section [thorax] two wings are found. This insect is covered by some slender hairs, yellowish in colour; the median section [thorax] is black, inlaid with dark yellow spots; the last one [abdomen] is dark yellow, shadowed with black, having the shape of several united rings, **where the intestines are** [emphasis ours]. The head is black mixed with yellow; the beak with its cirrhi is yellow with black dots. The other two hairy cirrhi are pale yellow and contain some small black dots, orderly placed. This insect abounds, during the night, in swampy and maritime places; it bites violently, even through the clothes, and causes an intense itching; it brings a great discomfort with its clangorous voice. I had many nights of insomnia because of this insect; nor was it possible to out it by fire or other thing. There is only one remedy, not entirely efficient, that is, to burn dry ox dung to out it a little. **This image was delineated by means of a megascope** [emphasis ours].

NOTE. Some say that this insect is called by the Indians Yatium; this region, however, produces another kind of lazy and tame class of mosquitoes, although very peevish, devoid of a sting, called *Ietinga*. There is another yet, called *marigui*, very small, but it pesters men so much that it is almost unbearable].

That note was probably inserted by Jan de Laet, referring to culicids (*yatium*), chloropids (*ietinga*) and ceratopogonids (*marigui*).

Although making only a fleeting remark, Marcgrave's statement about the mosquito abdomen "where the intestines are" may lead us to think that he dissected the specimen; if this true, he was a pioneer in that, as the dissections and illustrations of internal organs of insects would only be published, e.g., by Hooke (1665; mosquito larva), Malpighi (1669; silkworm's nervous system and male genitalia) and Swammerdam 1675, 1682, 1695, 1737–1738).

In his *De Indiae utriusque re naturali et medica*, Piso (1658: 288–289) described the *mberobi*, after reproducing almost *verbatim* Marcgrave's 1648 descriptions of the *Culex elegans* and the *nhatiú*.

*Mberobi* –: “*Tandem tertium genus Culicum restat describendum, quod Mberobi dictum diversae est magnitudinis, adeoque profunde pungens, ut aculeum vulnere infixum relinquat, isque mox corrupta parte laesa transmutetur in insectum huic Mberobi simile, habens sex crura, quorum ultimum par longissimum. Cornicula duo in capite, alae quatuor variegatae. Tota musca viridis est cum aureo mixti, in fronte sapphirini coloris. Oculis nigri corniculares*”.

[Finally, it remains to describe the third genus of mosquitoes [sic], called *Mberobi*. It is of a different size and stings so deeply that it leaves the sting buried in the wound; the sting, as the offended part becomes corrupted, transforms itself into an insect similar to the *Mberobi*, with six legs, the posterior pair of which is very long. It has two small horns in the head. Four variegated wings. The entire fly has a golden-green colour, sapphire-blue on the front. The eyes are black and coracoid].

This text of Piso is extremely elusive. It may be interpreted as a reference to *Dermatobia hominis*, but Piso says “pungens” (stings) and that this “Mberuobi” left the sting within the wound. He admitted that by spontaneous generation and the corruption of the wound matter, a larva would result, in the end transforming itself into a new Mberuobi. However, he says that this insect has *four* wings. In the *Libri Principis* (cf. Teixeira, 1995c: 116) there is a figure, drawn by one of Nassau's artists, representing a green bee, under the name Mberuobi; according to Drs. Kelli Ramos and Carlos Roberto Ferreira Brandão (Museu de Zoologia, Universidade de São Paulo, pers. comm.) it is probably a male (as indicated by the shape of the posterior leg) of *Euglossa* (Apidae, Apinae, Apini, Euglossina). Could have Piso confounded that bee, which stings, with the presence of a *Dermatobia* larva within the skin?

Also in the *Libri Principis* (cf. Teixeira, 1995c: 123) one of Nassau's artists represented very faithfully, and in colours, an adult of *Ornidia obesa* (Fabricius, 1775) (Syrphidae), under the simple designation of *Merú* (“fly” in Tupi).

**The “Nuevo descubrimiento del río de Marañon llamado de las Amazonas” of Friar Laureano de la Cruz (1653).** Friar Laureano Montes de Oca de la Cruz wrote an important and very humane document about the intents of

Franciscan Fathers to convert the Omagua Indians of the Upper Amazon (the present region of the city of Tefé, State of Amazonas, Brazil) (cf. Cruz 1885, 1900; Da Civezza 1879; Papavero *et al.* 2002: 207–234). Several passages mention the pest of mosquitoes:

“*En las dichas islas, y con todas las incomodidades que hemos referido, pasamos tres años, y nos conservó Nuestro Señor con los miserables Omaguas en buena paz y amistad. Comíamos de lo que ellos comían, y nos daban de buena gana, que nunca nos faltó, y bebíamos de los vinos que ellos hacían, à mas no poder, por no ser nada limpios. Para reparo de los mosquitos usamos para dormir de unos toldos de lienzo, de que tambien ellos usan, aunque de diferente materia, porque los hacen de los desechos de las mantas y camisas de que se visten. Y estos toldos tambien servían de reparo de unas avecillas nocturnas que nosotros llamamos Murciélagos, y ellos Anera [Andirá], que muerden à la gente estando durmiendo, y les chupan la sangre sin sentirlo. Para los mosquitos que molestan de día, y tambien para el calor, usamos de unos abanicos de plumas que ellos nos daban*”.

[In the aforesaid islands, and with all the incommunities that we have referred, we spent three years, being preserved by Our Lord with the miserable Omaguas in good peace and friendship. We ate what they ate and gave us with good will, which never lacked us, and drank the wine they made, as much as we could, for it was not at all clean. To avoid the mosquitoes we used for sleeping some nets of cloth, which they also use, although with different fabrics, because they make them with remains of the coverlets and shirts with which they dress themselves. And those nets also served to protect us from some little birds that we call bats and they Anera [Andirá], which bite sleeping people and suck their blood without them feeling it. For the mosquitoes which molest us during the day, and also for the heat, we used some fans made of plumes that they gave us”].

Nordenskiöld (1922: 121) used this passage and others by different authors to advance the hypothesis that South American Indians did not know mosquito nets; that these are introduced by European colonizers.

**The Voyage of Father João de Sotto Mayor up the Pacajá river in 1656.** A brief biography of father Sotto Mayor and a transcription of his *Diario da Jornada ao Pacajá* [or Bacajá, a tributary of the Xingu river] *em 1656* is given in Papavero *et al.* (2002: 237–244). This *Diario* was published originally by Azevedo (1916). The following passages talk about the scourge represented by mosquitoes:

“*Eu, por não estar ocioso, quis visitar uma aldeia e outras casas que estão rio acima, o qual, se até aqui se navega, dificultosamente é navegavel, por não ser mais que uma ribeira semeada de penedos e rochas; e assim me metti numa ubá com cinco moços, e caminhando pelo rio acima sete dias, com grande trabalho, por cima de pedras, já*



*por baixo de matto; porque a agua, como enfadada de impeçar em tanto calhao, se retira de sua aspereza e, entrando pelo matto, busca caminho mais brando, e como isto, por outra parte, até agora não foi escondedouro dos Pacajás fugidos, elles o tinham tão inculto que parecia não habitar por aqui gente, e assim nos era necessário ir fazendo o caminho a machado, para passar a ubá. As topadas e immundicies e o mais que eu sofri nestes sete dias de chuva e calma, por não levar toda a ubá, nem ser capaz disto: os jateuns que toda a noite nos faziam gastar passeiando, suspirando pela manhã para escapar de seus ferrões fôra para mim materia de assás merecimento se eu o soubera offerecer a Deos” (Azevedo, 1916: 172).*

[In order not to remain idle, I decided to visit a village and other houses situated upriver, whose river, if navigable up to here, is difficultly navigable [further on] as it is only a rivulet sowed with cliffs and rocks; thus, I placed myself in a dugout canoe with five young fellows and, going up the river for seven days, with great trouble, because the water, as if it were tired of being impeded by so many rocks, escapes their asperity and, entering the forest, looks for easier routes, and as this place, on the other hand, up to now has not been a hideout for runaway Pacajás [Indians], they had left it so uncultivated that it seemed uninhabited by people, and thus it was necessary to open our way using axes, in order to pass the dugout canoe. The coups and the dirtiness that I suffered in those seven days of rain and stillness and more things [caused me?] not to be able to carry the dugout canoe, being unable to do that: the jateuns kept us walking around all night, yearning for the morning in order to escape their bites; it would be a matter of great merit for me if I could have offered [this suffering] to God].

*“...ao outro dia, que era o da Ascensão de Christo, demos em um rio que passamos com agua pelos peitos, e chegamos à Aldeia, com trabalho, por levar os Indios doentes. Não está ella sobre o rio, por respeito dos muitos jateuns, que n’elle vivem, mas mettida pela terra dentro uma meia légua. (...) Metti-me em uma ubá com o altar portatil e trez Indios mais que apenas ella pode levar, e com eles me lancei pelo rio abaixo para ver o que Pedro da Costa determinava; gastei na viagem treze dias, caminhando a grandes jornadas, desde o sol nascer até se pôr, com muita incomodidade de mosquitos, chuvas e sol, por a ubá ser limitadissima, sobretudo com fome” (Azevedo, 1916: 176).*

[...at the other day, which was that of Christ’s Ascension, we came to a river that we waded with water up our chests and reached the Village, with much trouble, for we were carrying the sick Indians. It is not over the river, because of the many jateuns living in it, but placed in the interior for about a half league. (...). I placed myself in a dugout canoe with the portable altar and three Indians, more than it could carry, and with them I went down the river to see what Pedro da Costa had determined; I spent thirteen days on this voyage, proceeding at lengthy journeys, from sunrise to

sundown, with much incommodity of mosquitoes, rains and sun, and for being the dugout canoe very limited, but moreover with hunger].

*“...e porque não estava para andar, por ter um grande golpe na solla do pé, com outros menores que arrastar da ubá recebi das pedras cegas, que estão no rio, mandei um Indio por terra a que fosse dizer aos da aldeia que estava eu alli: eu fiquei só com outro companheiro esperando a resposta; e porque de nenhum modo podemos parar à beira do rio com mosquitos e outras sevandijas, de dia e de noite, como pude, me metti pelo matto dentro um terço de legua com o meu companheiro, que apenas achava com que sustentar os dous...” (Azevedo, 1916: 179).*

[...and because I wasn’t able to walk, having suffered a great coup in the sole of the feet, with other smaller ones which, dragging the dugout canoe, I had received from the blunt rocks which are in the river, I sent an Indian overland to tell those in the village that I was there: I remained with only another companion waiting for an answer; and because we could in no way stay at the river margin with mosquitoes and other pests, day and night, as best as I could, I proceeded through the forest within a third of a league with my companion, who was barely able to maintain both of us...].

**Maurício de Heriarte (1662).** For a short notice about Heriarte and a reproduction of his *Descriçam do Estado do Maranhã, Para, Corupa, Rio das Amazonas* (1662) see Papavero *et al.* (2002: 245–269). The manuscript of this relation, in the Imperial Library of Vienna (nowadays Österreichischen National-Bibliothek Wien) was first published by Varnhagen (cf. Heriarte 1874). Nowotny (1964) published a facsimilar edition of this manuscript. Our citations are based in this latter work.

*“Este rio [o Negro] nam tem mosquito, como os mais das Amazonas, nem outro genero de praga ruim” (p. 59).*

[This river [Negro] does not have mosquitoes, like the other ones in the Amazon, nor any other kind of evil pests].

Heriarte ascertained for the first time this singularity of the rio Negro.

*“Nesta provincia [dos Aguás] a muitos Iacares e muitos mosquitos de diferentes castas, que, suposto os há em tudo o rio, nesta Provincia sam sem numero, e grandes; o que deve ser pellas muitas ilhas que tem” (p. 63).*

[In this province [of the Aguás] there are many alligators and mosquitoes of different kinds, which, although they exist all over the river, in this province they are numberless and big, and this may be due to the many islands that it has].

*“Esses indios [Capinas, tribo do alto Amazonas] não usam de redes para dormir: todos dormem em camas toldadas por se liurarem dos mosquitos, que há muitos por este rio das Amazonas” (p. 78).*



[These Indians [Capinas, a tribe from the upper Amazon] do not use hammocks: all of them sleep on canopied beds to get rid of mosquitoes, of which there are many along this river of the Amazons”.

“*Só o que tem [o rio Amazonas] de mau, e ter muitos mosquitos de diferentes generos e especies; mas o desmontando e continuando, cessa esta praga, que não he mais que bela veira do rio; e por dentro os não ha*” (p. 97).

[The only bad thing [the Amazon river] has is having many mosquitoes of different genera and species; but getting out of it and proceeding [inland], this pest ceases, existing mostly along the river margin; inland they do not exist].

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