

Essays on the history of Brazilian dipterology. I. The first notices about Brazilian Diptera (16th century)

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ABSTRACT. Essays on the history of Brazilian dipterology. I. The first notices about Brazilian Diptera (16th century). This paper presents a historical resume of the first notices about Brazilian Diptera during the 16th century, given by Francisco Pires in 1552 (the oldest mention known), José de Anchieta, Leonardo do Valle, Pero de Magalhães de Gandavo, Jean de Léry and Gabriel Soares de Souza, ending with Fernão Cardim, who made the last mentions of Brazilian Diptera in that century.

KEYWORDS. Brazil; Dipterology; History; 16th century.

RESUMO. Ensaio sobre a história da Dipterologia brasileira. I. As primeiras notícias sobre dípteros brasileiros (século XVI). Este trabalho tem como objetivo apresentar um resumo histórico das primeiras notícias sobre dípteros brasileiros no século XVI, dadas por Francisco Pires em 1552 (a mais antiga menção conhecida), José de Anchieta, na famosa “Carta de São Vicente”, Leonardo do Valle, Pero de Magalhães de Gandavo, Jean de Léry e Gabriel Soares de Souza, finalizando com Fernão Cardim, que fez as últimas menções aos dípteros brasileiros nesse século.

PALAVRAS-CHAVE. Brasil; Dipterologia; História; século XVI.

The history of dipterology in Brazil goes back to the second half of the 16th century with the first references to Brazilian dipterans. During this century, most of the writings about Brazil were due to jesuit missionaries sent to Brazil. In addition to the hardships met with in the New World, they also had to suffer the fierce attacks of bloodthirsty dipterans, “especially the fresh men, which have their blood fresh and tender, with the good Bread, Wine and delicate fare of Portugal!” as declared by Father Fernão Cardim (see below). As most of them became established along the Brazilian coast, in villages surrounded by mangrove areas, they were especially subjected to the vicious bites of ceratopogonids, a recurrent remark in their writings.

This paper offers a historical resume of the first notices about Brazilian Diptera during the 16th century; beginning with the oldest known reference to Brazilian mosquitoes made by Francisco Pires in 1552, followed by the famous “Letter from São Vicente” written by José de Anchieta and the notices given by Leonardo do Valle, Pero de Magalhães de Gandavo, Jean de Léry, Gabriel Soares de Souza and Fernão Cardim, who made the last mentions of Diptera in that century.

With the exception of the books by Gandavo and Léry, all other writings were only published in the ensuing centuries.

The first jesuits in Brazil. Father Francisco Pires and the oldest citation of mosquitoes (1552). March 29, 1549 – The first Governor-General, Dom Tomé de Souza, arrived in Brazil, accompanied by the first mission of jesuits, composed by fathers Manuel da Nóbrega, João de Azpilcueta-Navarro,

Leonardo Nunes, Antonio Pires and the novices Diogo Jacome and Vicente Rodrigues. Leonardo Nunes and Diogo Jacome were sent to the Captaincies of Ilhéus and of Porto-Seguro; Navarro and Pires to the villages of the Captaincy of Bahia.

The second mission to arrive in Brazil, in 1550, in the fleet of Simão da Gama de Andrade, brought four jesuits more – fathers Salvador Rodrigues, Francisco Pires, Manuel de Paiva and Afonso Brás.

In a so-called “Carta dos meninos órfãos” [Letter of the orphan boys], written by father Francisco Pires to father Pero Doménech in Lisbon, dated from Bahia [Salvador, state of Bahia], 5 August 1552 (Leite 1956: 589) the oldest known reference to Brazilian dipterans (mosquitoes) may be found:

“Fuimos por la playa do hallamos otro limonar que nos dió mucho trabajo, principalmente a los niños por los muchos mosquitos que nos mordían, y desta manera fuimos hasta llegar a una boca de un río [em Matoim, atual Candeias, BA] que pasamos en una canoa, donde está agora en casa.”

[We went through the beach, where we found another lemon grove [?] which gave us much trouble, especially to the boys, because of the mosquitoes that bit us, and in that manner we proceeded until we reached the mouth of a river [in Matoim, now Candeias, state of Bahia], which we crossed in a canoe, to where now is the house].

Francisco Vásquez and the relation of the voyage of Pedro de Ursúa and Lopes de Aguirre (1559–1561) down the Amazon river. An account of this dramatic and violent voyage and Vásquez’s relation may be found in Papavero *et*

al. (2002: 43–89). In this relation Vásquez complained about the Amazonian mosquitoes:

“*Tiene este río Marañón, según los que se precisan de entenderlo, más de 1600 leguas desde su nacimiento a la mar. Es tan grande y poderoso que no se puede escribir su grandeza; anega en cualquier parte al tiempo de su creciente más de cien leguas de tierra llana fuera de su madre: hay en él tanta cantidad de mosquitos, especialmente los zancudos de noche y de día, que es temeridad ver que los sufran los naturales*” (Vásquez 1987: 107).

[This Marañón river [the Amazon] has, according to those who are deemed to know it, more than 1600 leagues from its origin to the sea. It is so large and powerful that its grandeur cannot be described; it drowns during any part of the time of its rise more than a hundred leagues of flat earth outside its bed: there is in it such a quantity of mosquitoes, especially the long-legged ones, night and day, that it is temerity to see how the natives can stand them].

Father José de Anchieta (1560, 1587). On 13 July 1551 the second Governor-General, Dom Duarte da Costa, landed in Brazil, with the third jesuitic mission, including fathers Luís da Grã, Brás Lourenço, Ambrósio Pires, and the novices Gregório Serrão, João Gonçalves, Antônio Blásquez and José de Anchieta. In 1554 Father Manuel da Nóbrega sent, to the grasslands of Piratininga, 13 priests and novices, under the command of father Manuel de Paiva, to found the Saint Paul College, dominating the valleys of the Tietê and Anhangabaú rivers, where the inaugural mass was performed on 15 January; that college was the nucleus of the future city of São Paulo. Among the priests was included father José de Anchieta.

In a famous letter written in São Vicente, “in the last day of May 1560”, *Epistola quam plurimarum rerum naturalium quae S. Vicenti (nunc S. Pauli) provinciam incolunt* [Letter about several natural productions inhabiting the Province of São Vicente (now São Paulo)], the first lengthy report on Brazilian animals (Paiva 2003), Anchieta (1988: 133; cf. also Papavero & Teixeira 2007: 58) declares:

“*Há pelo mato grande cópia de moscas e mosquitos, os quais, sugando-nos o sangue, mordem cruelmente máxime no verão, quando os campos estão alagados; uns têm o ferrão e as pernas compridas e sutilíssimas; furam a pele e chupam o sangue, até que, ficando com todo o corpo muito cheio e distendido, mal podem voar; contra estes é bom remédio a fumaça, com a qual se dispersam. Outros chamados marigui, e que habitam à beira-mar, são uma praga terrível; são tão pequenos que mal os podes perceber com a vista; és mordido, e não vês quem te morde; sentes-te queimar e não há fogo em parte alguma; não sabes de onde te veio repentinamente semelhante incômodo; se te coças com as unhas, maior dor sentes; renova-se e aumenta por dois ou três dias o ardor que deixaram no corpo.*”

[There is in the woods a great copy of flies and mosquitos, which, sucking our blood, bite cruelly, especially in the summer, when the fields are flooded; some have the mouthparts and the legs long and very thin; they bore the skin and suck the blood up to the point when, having their bodies very full and distended, they can hardly fly; smoke is a good measure against them, as it

disperses them. Others, called mariguis, which inhabit the coast, are a terrible pest; they are so small that can hardly be perceived with the eye; you are bitten and you don't see who bit you; you feel yourself burning and there is no fire anywhere; you don't know whence came so suddenly such a nuisance; if you scratch yourself with the nails, a greater pain is felt; the burning they left in your body is renewed and increased for two or three days].

This is the first mention of Brazilian blood-sucking *Culicoides* (Ceratopogonidae).

Those Mariguis had even the honor of being sung in verses, in the Tupinambá language, in a theatrical play composed by father Anchieta in 1587 (cf. Martins (M. de L. de P.), 1948: 58 (versos 718–723); see also Cardoso 1977):

“*Ejori*
Xeçuumo mariguí.
Onharõ moxi, xe une
aciquiye, ariri
eçapiate, xe miri
Xe mocõ cori yandune”

[Come!/The mariguis are biting,/they become greedy for flesh, eating!/I'm afraid, I'm shaking!/Look, I'm so small!/They'll swallow me].

The “Historia da Província Santa Cruz a que vulgarmente chamamos Brasil” of Pero de Magalhães de Gandavo (1576). Gandavo (1576 (chapt. viii) and 1858; cf. Papavero & Teixeira 2007: 90) also mentioned Ceratopogonidae from mangrove areas:

“*Tambem ha muita infinidade de mosquitos principalmête ao longo dalgũ Rio antre humas aruores q' chamão manges não pode nenhũa pessoa esperallos e pello matto quando não ha viração são muj sobeios e perseguem muito a gente.*”

[There is also an infinity of mosquitos, especially along some river among some trees called mangroves; nobody can stand them, and in the woods, when there is no wind, they are very excessive and persecute people very much].

Jean de Léry (1578). Born in 1534 in Margelle (Bourgogne). In Geneva he was possibly working as a shoemaker and studying theology. Léry left for Brazil with thirteen others in November 1556, headed for the colony founded the year before by Nicolas Durand, Chevalier de Villegagnon, the so-called *France Antarctique*, in an island in the Bay of Guanabara, Rio de Janeiro. Although Villegagnon had promised the Protestants (among them Léry) religious freedom, he quickly began to contest their beliefs and persecute them. After eight months, the Protestants left the colony and spent two months on the mainland in close proximity to the Tupinambá Indians of the region. These experiences were the origin of Léry's *Histoire d'un voyage faict en la terre du Bresil, autrement dite Amerique* (1578), where we find the following passage (Léry 1578):

“*Dauantage l'air de ceste terre du Bresil produit encores vne sorte de petits mouchillons, que les habitans nomment Yetin, lesquels piquent si viuement, voire a trauers des legers*

habillemens, qu'on diroit que ce sôt pointes d'esguilles. Par tant vous pouuez penser quel passetemps c'est, de voir nos Sauuages tous nuds en estre poursuyuis: car claquans lors des mains sur les fesses, cuisses, espauls, & sur tout leurs corps, vou diriez que ce sont chartiers avec leurs fouets" (Léry, 1578: 183).

[Moreover the air of this land of Brazil produces yet a sort of very small flies, which the inhabitants call Yetin, the which sting so strongly, even through light vestments, that one would say they were points of needles. Therefore you may think what a pastime it is seeing our Savages all naked being persecuted; because, hitting their hands over the buttocks, thighs, shoulders and over their entire body, you would say they were chastised [?] with their whips].

Léry mixed up the Yetin (French rendering of nhitinga, or jitinga, a chloropid), with certain species of Culicidae.

After returning to France, Léry married, apparently unhappy, became a Protestant minister, and joined with Protestant troops in France's religious wars. One of his most difficult experiences, the siege of Sancerre, became the subject of his first published work, the *Histoire mémorable de la ville de Sancerre* (1574). Léry recounted that his Brazilian experience served him well, as he taught his fellow soldiers to make hammocks and eat anything, even the soles of their shoes. However, he remained shocked by cannibalism, especially when committed by supposedly civilized members of his own culture. He died around the year 1613.

Father Leonardo do Valle (1585). For a short biography of father Leonardo do Valle and the history of his manuscripts, see Papavero & Teixeira (2007: 116–117).

In a letter sent from "Bahia de Todos [sic] Santos", 26 June 1562, to some priests of the Society of Jesus (*in Academia Brasileira de Letras*, 1931: Academia Brasileira de Letras, 1931:356) he cited mosquitoes:

"[O irmão Scipião] *quiz-se tanto accomodar-se aos naturaes da terra [índios] que lhe fez mal, porque, como foi na aldeia, deixou as meias calças, e como a terra soffrêra mais andar homem mal arroupado que mal calçado e os mosquitos são muitos, achou-se tão mal de feridas que lhe nasceram nos pés e pernas que veio a não poder andar, polo que foi necessario trazerem-no ao collegio*".

[[Brother Scipião] wanted so much to imitate the natives of the land [Indians] that he was hurt, because, having left his long socks in the village, and as this land spares more the ill dressed man rather than one which goes barefoot, he found himself so badly hurt by the wounds which grew on his feet and legs that he was no longer able to walk, so it was necessary that he be brought to the [Jesuit] college].

But his most important contribution was the compilation of a rich vocabulary of the "Brazilian" (Tupi) language, by far the best list ever made of Tupi names of animals, which was copied (at least in part) and adapted by several Jesuits, all over Brazil, up to the 18th century. This vocabulary, composed in 1585, was first published by Ayrosa (1938), from a manuscript copy dated from 1621, made at the village of

Piratininga (São Paulo); Ayrosa attributed it to an anonymous author. Another manuscript, a much better copy, found at the National Library in Lisbon, was edited by Drumond (1952, 1952–1953). A third manuscript, belonging to the National Library in Rio de Janeiro, incomplete (names beginning with A and B are missing) was published by Barbosa (1948).

We list below the names of Diptera cited by him (from Drumond, 1952–1953; in parentheses, the Roman cardinal indicates Drumond's volume and the Arabic one the page):

Bernes, certos bichos q' no mato entrão em pessoas sans e nos cans – Ura (I, 54) [Bernes, certain worms which in the forest enter healthy persons and dogs]. First reference in Brazil of *Dermatobia hominis* (Linnaeus Jr., 1764) (Culicidae).

Bichos de carne, ou peixe podre – Ura. *Mormente os q' nascem de barejas porq' outros q' a própria podridão da carne produz também os chamão Igçoca. Çaçoca.* (I, 55). [Worms from the flesh, or rotten fish – Ura. Especially those which are born from maggots, because the others which are produced from the flesh's own putrefaction are also called Igçoca [and] Çaçoca]. Another reference to *Dermatobia hominis* and its larvae (called barejas – warbles); the names Igçoca and Çaçoca were applied by the Indians to several different larvae, but in this passage Leonardo do Valle designates the larvae of Calliphoridae, which at that time were still believed to be spontaneously generated from putrefied substances [cf. Papavero *et al.* 2010].

Bichos, por todos os que nascem dentro da fruíta. E similia – Çaçoca. (I, 55) [Worms, in general for all those born inside fruits, and similar ones]. Possible reference to Tephritidae larvae.

Mosca – Berû. (I, 43) [Fly – Berû]. General designation of flies, especially muscoids.

Moscas do gado – Mutucuçû (II, 43) [Cattle flies – Mutucuçû] – Unidentified Tabanidae.

Mosquitos que mordem – Piû: *estes são os borrachudos, os das pernas compridas Nhatiû, os piqueninos dos mangues Marigui; os seus semelhantes do mato, Mariguiûna e são ainda menores* (II, 43). [Mosquitos that bite – Piû; these are the borrachudos, those with long legs Nhatiû, the very small from the mangroves Marigui; their kins from the woods Mariguiûna are smaller yet]. Nhatiû was a common designation for Culicidae. Leonardo do Valle was the first to register the words pium and borrachudo; the former is nowadays used in the Amazon; the latter name in the rest of Brazil. Mariguiûna (the black (una) marigui) is an unidentified Ceratopogonidae.

Mosquitos, como de uinho – Nhetigaruru; *outros bem pequenos que acodem às feridas e põe cancer*: Nhetiga (II, 43). [Mosquitoes, like those from wine – Nhetigaruru; others very small which frequent wounds and cause cancer: Nhetiga]. The first name probably refers to Drosophilidae. The second to Chloropidae, here reputed for the first time as transmitters of yaws ("cancer"); see below, under Gabriel Soares de Souza.

Piû and *Yatiû* were afterwards also cited by Anchieta (1595: 6v (1946: 6v)).

Gabriel Soares de Souza (1587). Undoubtedly the best writer about Brazilian natural history in the 16th century, in his *Tratado descritivo do Brasil em 1587* [Descriptive treatise of Brazil in 1587] (cf. Sousa, 1851) Gabriel Soares de Souza dealt more completely with several dipterous pests, although establishing some confusion among the species treated. Speaking of some brachycerous flies (Souza (G. S. de) 1825: 213), he said:

“E porque as moscas se não queixem, convem que digamos de sua pouca virtude; e comecemos nas que se chamam mutuca, que são as moscas geraes e enfadonhas que ha em Hespanha; as quaes adivinham a chuva, começando a morder onde chegam, de maneira que, se se sente sua picada, é que ha boa novidade. Ha outra casta de moscas, a que os indios chamam muruanja que são mais miudas que as de cima e azuladas; estas seguem sempre os cães e comem-lhe as orelhas; e se tocam em sangue ou chaga, logo lançam varejas. Merús, são outras moscas grandes e azuladas que mordem muito, onde chegam, tanto que por cima da rede passam o gibam a quem está lançado nella, e logo fazem arrebentar o sangue pela mordedura: aconteceu muitas vezes porem ellas varejas a homens que estavam dormindo, nas orelhas, nas ventas e no céu da boca, e lavrarem de feição por dentro as varejas, sem se saber o que eram, que morrêram alguns disso. Também ha outras como as de cavallo, más mais pequenas e muito negras, que também mordem onde chegam”

[And so that flies do not complain themselves, it is convenient that we say something about their little virtue, and we shall begin with those called mutuca, which are [similar to] the common and tiresome ones existing in Spain; they predict rain, beginning to bite where they arrive, in such a manner that, when their bite is felt, is that there is a good novelty [arrival of rains]. There is another kind of flies, called muruanja by the Indians, which are smaller than those above and bluish; these follow the dogs and eat their ears; and if they touch in blood or sore, immediately launch maggots. Merús are other large and bluish flies which bite very much where they alight, so much that over the hammock they perforate the doublet of those who are reclining in it, and very soon make the blood pour from the bite; it happened several times that they laid maggots in sleeping men, in the ears, nostrils and in the palate, the maggots eating their way inside them, and not knowing what they were, some died because of that. There are also some flies such as those of horses, but smaller and much blacker, which also bite where they alight].

Mutuca is the Tupi word for tabanids; certain species are really most abundant at the beginning of the rainy season.

Muruanja [the “j” here has the value of “i”] (also known as *beronha*, *beruanha*, *meruanha*, *muruanha*, from the Tupi *mberu* = fly and *ãi* = sharp, with a sting) is *Stomoxys calcitrans* (Linnaeus, 1758) (Muscidae). But Souza makes two mistakes – it is not bluish, and does not cause myiasis. He confounded it in this passage with calliphorids of the genus *Cochliomyia*.

Merú (Tupi *mberu*, general designation of flies, especially muscoids). Souza confounded in this paragraph the syrphid *Ornidia obesa* (Fabricius, 1775), called *mberuobi* (“blue fly”) by the Tupi Indians, with calliphorids of the genus *Cochliomyia*, agents of obligatory myiasis in man and animals,

also sometimes called *mberuobi*. In Brazilian folklore, up to now, the innocent *Ornidia* is at times blamed as an agent of myiasis. This is the oldest citation in Brazil of myiasis caused by *Cochliomyia*. But neither *Ornidia* nor *Cochliomyia* are hematophagous and do not bite; some confusion with culicids has been introduced here by the author.

In the following chapter Souza (1825: 214) dealt with chloropids and some Nematocera:

“Digamos logo dos mosquitos, a que chamam nhitinga; e são muito pequenos e da feição das moscas; os quaes não mordem, mas são muito enfadonhos, porque se põem nos olhos, nos narizes; e não deixam dormir de dia no campo, se não faz vento. Estes são amigos de chagas, e chupam-lhe a peçonha que tem; e se vão pôr em qualquer cossadura da pessoa sã, deixam-lhe a peçonha nella, do que se vem muitas pessoas a encher de boubas. Estes mosquitos seguem sempre em bandos as indias, que andam nuas, mormente quando andam sujas do seu costume. Marguís são uns mosquitos que se criam ao longo do salgado, e outros na terra perto d’agua, e apparecem quando não ha vento; e são tamanhos como um pontinho de penna, os quaes onde chegam são fogo de tamanha comichão e ardor que fazem perder a paciencia, mormente quando as aguas são vivas; e crescem em partes despovoadas e se lhe põem a mão, desfazem-se logo em pó. Ha outra casta, que se cria entre os mangues, a que os indios chamam inhatiúm, que tem as pernas compridas e zunem de noite, e mordem a quem anda onde os ha, que é ao longo do mar; mas se faz vento não apparece nenhum. Pium é outra casta de mosquitos tamanhos como pulgas grandes com azas; e em chegando estes à carne, logo sangram sem se sentir; e em lhe tocando com a mão se esborracham; os quaes estão cheios de sangue; cuja mordedura causa muita comichão depois, e quer-se espremdida do sangue por não fazer guadelhão [gudilhão, pequeno tumor; cf. Bluteau 1713: 751] na carne. Ha outra casta de mosquitos, a que os indios chamam nhatium-açú; estes são de pernas compridas, e mordem e zunem pontualmente como os que ha em Hespanha, que entram nas casas onde não ha fogo; de que todos são inimigos”.

[Let’s talk presently about the mosquitoes [here employed as meaning “small flies”] called nhitinga; they are very small, and of the fashion of flies, but do not bite, but are very tiresome, because they place themselves in the eyes and the nostrils; and they do not allow one to sleep in the field, if there is no wind. These are fond of sores, and suck the venom out of them; and placing themselves in any itching of a healthy person, they leave that venom in them, whereby many people come to be filled with yaws. These mosquitoes always follow in swarms the Indian women, especially when they are soiled by their menstruation [tentative interpretation of the original Portuguese]. Marguís are mosquitoes that breed along the sea coast and others in the land, near the water, appearing when there is no wind; and are the size of a dot made with a pen, and wherever they sit, they cause a fire of such an itching and burning that one loses his patience, especially during high water seasons; and they grow in unpeopled parts and if the hand is placed over them, they are soon reduced to powder. There is another kind, which breeds among the mangroves, called by the Indians inhatiúm, which have long legs and buzz at night, and bite those who walk in places where they exist, that is along the sea coast, but if there is wind not one of them appears. Pium is another caste of mosquitoes the size of

large fleas, with wings; these, alighting in the flesh, make it bleed insensibly; touched with the hand they are crushed, and are filled with blood; their bite causes much itching afterwards and [the affected area] must be squeezed out of the blood in order not to cause tumors in the flesh. There is another caste of mosquitoes, which the Indians call nhatium-açú: these have long legs and bite and buzz punctually as those from Spain, which enter the houses where is there no fire and of which everybody is enemy].

Nhitinga is the Tupi name applied to Chloropidae, first cited by father Lourenço do Valle, who also associated them with “cancer” of the skin, as we have seen above. Gabriel Soares de Souza, considered by most authors as the first to register the role of chloropids in the dissemination of yaws, only confirmed the earlier discovery made by father Valle.

Chloropids are attracted to fluids secreted by the eyes, nose and ears of man and animals and some species of *Liohippaelates* Duda have been shown to mechanically transmit the spirochete *Treporema pertenuis*, the causative agent of yaws (Machtiger & Kaufman 2011). In a historical background about yaws in Brazil, Guimarães (1953) mentioned that possibly the disease was brought to Brazil by the African slaves sent to the country directly from Africa, after 1538. Until 1905, yaws and syphilis had their identities confused, when Castelani identified the agent of yaws, morphologically very similar with *Treponema pallidum*, the agent of syphilis (Carrara 1997).

Marguís are the *mariguís*, already seen above.

Pium – Simuliidae.

Inhatium and nhatium-açú are unidentifiable species of Culicidae.

Father Fernão Cardim (end of the 16th century). Father Fernão Cardim came for the first time to Brazil as secretary of Father Christóvão de Gouvêa, Visitor of the Society of Jesus. They landed in Bahia on May 1583. In 1598 Cardim returned to Europe, to assume the post of Procurator of the Jesuit Province of Brazil in Rome. Once accomplished that mission, he was returning to Brazil, when the Flemish ship in which he was voyaging was captured by English pirates, and some members of the crew, including Cardim, were taken to England as prisoners. His manuscript *Do clima e terra do Brasil* [On the climate and land of Brazil], stolen by the pirates, was sold to the editor Samuel Purchas, who published it, in an English translation, in 1625 (although wrongly attributing its authorship to Manuel Tristão) [see also Cardim 1906; Purchas' 1625 text is reproduced in Chiquieri *et al.* 2011]. The priest remained in prison until 1603, when he was finally set free to return to Brazil as Provincial of the Society of Jesus, a position held until 1609, when he was made Rector of the Jesuit College of Bahia and elected Vice-Provincial. He died in Bahia on 17 January 1625.

Cardim was the last to mention Diptera in the 16th century:

“In these Creekes are a certaine kinde of Gnats called Mareguís as small as Hennes Lice, they bite in such sort, that they leave such a Wheale, smart and itching that a man cannot helpe himself, for even through the clothes they prick, and it is a good

penance, and mortification to suffer them on a Morning, or an Evening; there is no other remedie to defend themselves from them, but to anoint themselves with dirt, or to make a great fire and smoke” (Cardim in Purchas 1625: 1316).

“Above all this, Brasill hath one commoditie for men to live, that in it doe live disorderly, that there are but few Lice or Fleas, but among the Indians, and Guinne Moores there are some Lice. But there want no Hornets, Dorres, Waspses, Flies, and Gnats of so many kinds, and so cruell and venomous, that stinging any person, the place swelleth for three or foure dayes, especially in the fresh men, which have their blood fresh and tender, with the good Bread, Wine and delicate fare of Portugall” (Cardim in Purchas 1625: 1320).

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