



“Ni vazana tsy aseho vahiny” - “Don’t show your molars to strangers” - Expressions of teeth blackening in Madagascar

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Research

Abstract

Although Madagascar is geographically disjunct from Southeast Asia, Micronesia and Melanesia, where intentional blackening of teeth used to be ubiquitous, this study found the practice deeply rooted in Malagasy culture. Men and women accomplished teeth blackening not only by chewing various, mostly endemic, plants, but also by applying organic burn products as well as a combination of mineral rich soil and barks containing tannins. The highly developed oral literature of Madagascar, in which teeth blackening features frequently, provides material to study the diverse associations which the practice and the requisite plants evoked. These connotations reached from the overtly sexual to affirmations of various core cultural values. For example, when teeth blackener was removed again from frontal teeth to render them white, while keeping molars blackened, this pattern not only held esthetic appeal, but also somatically expressed a desire for concealment versus revelation of the private self. The widespread distribution of teeth blackening across the island and similarities to methods known from Austronesian speakers elsewhere are some of the indications that teeth blackening might have reached Madagascar during its early phases of settlement by Austronesian speakers from the Indo-Malay archipelago. Surprisingly, betel chewing, a practice equally associated with Southeast Asian people, appears to have reached Madagascar at a relatively late date by way of the Swahili coast. Neither areca nut (*Areca catechu* L.) nor betel pepper (*Piper betle* L.) become naturalized across the island, nor did the usage of these plants penetrate Malagasy culture to any great extent.

Introduction

There is compelling evidence that in pre-colonial times teeth blackening was practiced across most of Southeast

Asia as well as parts of Micronesia and Melanesia. Such deliberate blackening was accomplished by applying diverse plant materials, sometimes combined with minerals, to the surface of the teeth (Zumbroich 2009, 2011). The prevalence of teeth blackening strongly correlated with the similarly wide-spread practice of chewing betel quids, which were composed of slices of the seed (‘nut’) of areca palm (*Areca catechu* L., *Arecaceae*) and slaked lime (calcium hydroxide) wrapped in a betel leaf (*Piper betle* L., *Piperaceae*). Betel chewing was known to cause incidental staining of teeth, typically of a less intense dark color. While neither practice was exclusively represented among speakers of one linguistic family, they were both particularly prevalent among Austronesian speaking people.

In this study I am exploring the issue of teeth blackening and other dental modifications in Madagascar. In populating this island at the crossroads of Asian and African worlds, Austronesian-speaking migrants from the Indo-Malay archipelago played a major role, thus placing it at

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the western fringes of the Austronesian sphere of influence (Adelaar 2009).

The following, reproachful lines belong to a popular genre of Malagasy poetry (**Hainteny**, see below):

**“Aza atao vavhadin-Rabehidy hono izy
ary aza atao vato misakan-dalana
fa ataovy laingo ery an-tenatena-solatra
ratsy ihany fa maro mpanao maintim-bazana”**

“Do not treat me like a gate with many locks,” he said, “and do not treat me like a stone that blocks the road, but treat me like the **laingo** plant in the middle of a sloping rock: it is ugly, but many use it to blacken their molar teeth.”¹

These verses exemplify that in the past the practice of teeth blackening did, indeed, play a role in the traditional culture of the Merina, whose home is in the central highlands of Madagascar. But teeth blackening and other dental modifications have gradually disappeared as cultural practices in Madagascar and can no longer be readily observed, except perhaps in some of the most remote locations.² An informal survey of contemporary anthropologists and linguists who have performed extended field work in Madagascar over the last decades suggests that the practice has by now almost entirely fallen into oblivion. This leaves many questions unanswered, including, what was the nature of teeth blackening plants, such as **laingo**, how deeply embedded did teeth blackening ever become in the traditional culture of the island and how did it come to play a role in the first place.

The symbolic significance of teeth in Malagasy culture is highlighted by the great regard in which teeth could be held in the cult of royal reliquaries, e.g., by Sakalava, Tañala and Mahafaly. The actual tooth of a deceased king was encased in the hollow of a crocodile’s molar, which was sometimes assembled to constitute a sort of amulet consisting of the relics of a series of successive rulers. Such teeth reliquary ultimately served to mediate the legitimacy and continuity of royal dynasties (Ballarin 2000,

McMahon 1892:390, Toussaint 1937).³ Far less attention has been paid to the symbolism of teeth among the living, in particular when teeth became the object of intentional modifications. Nor has previous scholarship arguing the relationship between Madagascar and the archipelago to the east raised the issue of teeth blackening (e.g., Kent 1970:50). While Malagasy personal adornments, especially in the form of textiles have been the subject of numerous monographs (e.g., Kusimba *et al.* 2004), the expressions and significance of dental modifications among different groups in Madagascar have never been studied in a comprehensive and scholarly fashion. In anthropological studies of the French colonial period some details about teeth blackening can be uncovered, even though it was at the time, with an ethnocentric taint, primarily understood as an act of cleaning the teeth.⁴

Against this backdrop, the present study approaches teeth blackening and the associated phenomena of betel chewing and teeth filing from a range of related vantage points, such as historical, ethnobotanical, linguistic as well as anthropological. The first objective of this paper will be to analyze the details of the practices and the ethnobotanical resources deployed in their pursuit in Madagascar, in particular in light of the diverse and distinctive ecology of the island. Primary sources are French colonial and missionary accounts as well as lexicographic data, supplemented by limited indigenous sources and ethnographic studies. As the introductory Malagasy lines have already exemplified, riddles, proverbs, songs and poems invoke teeth blackening plants and processes on many occasions. I will therefore systematically explore a number of different genres of Malagasy oral literature in an effort to deepen the understanding of the significance and associations that teeth blackening carried among different groups. Finally, I will discuss the different dental modifications within the framework of theories of the settlement of the island in order to understand whether these practices can be located within broader cultural zones and/or reflect uniquely Malagasy innovations. Last but not least, this study presents an effort to preserve the memory of an important facet of Malagasy cultural history that is on the verge of extinction.

¹To clarify the translation (Fox 1990:236-237) I have added the words ‘plant’ and ‘molar’. For certain quotes in the text I have included the Malagasy original to exemplify the rhythm and sound of the lines presented.

² There is little reliable information on the decline of teeth blackening. Statistical data collected in the course of a study on dental ‘pathologies’ in the mid 1950’s for the Tañala of east Madagascar showed that at the time seven percent of ‘children’ of unknown age still had blackened teeth (May 1968:394).

³ A weak connection between teeth reliquaries and teeth blackening can perhaps be detected in the fact that in a village where such a tooth reliquary was kept a taboo against bringing in a certain teeth blackener (**anandengo lengo**; *Mussaenda arcuata* Lam. ex Poir., (Rubiaceae)) existed (Toussaint 1937:39).

⁴E.g., in one the earliest Malagasy dictionaries the teeth blackening plant **laingio** (= **laingo**, see Table 1) is rendered as ‘a plant used in cleaning the teeth’ (Freeman 1835:146).

Plants and Practices: Dental modifications in Madagascar

Malagasy ‘Betel’ Quids

Around the early seventeenth century, French contacts with what we now know as Madagascar began to intensify and eventually led to detailed observations about the island’s inhabitants. Francois Cauche, who sailed on a French ship to the island in 1638, witnessed the visit of the king of the province ‘Madegasse’⁵ with a retinue of four hundred men around Port St. Luce in southeast Madagascar. Cauche noted that the king as well as all his followers had a tongue and teeth as black as **iyett** (Cauche 1651:10-11).⁶ Elsewhere in his travel account he detailed how such blackening was accomplished:

‘They call **Rave** the tree that we call **balisier** of which they chew the seed or grain to blacken their teeth and tongue, and they consider this a means to accomplish beauty, regardless of the bad odour which this grain causes’ (Cauche 1651:153).

The French common name **balisier** was historically applied to various plants in the order Zingiberales, particularly *Canna indica* L. (Cannaceae), in reference to their broad leaves which were used as envelopes (Spanish **balija**, ‘envelope’; Chaumeton *et al.* 1814:184). Cauche’s subsequent description of the plant (Cauche 1651:153-154), perhaps the first one altogether, in conjunction with his truncated rendering **Rave** of the indigenous name **ravinala** (‘leaf of the forest’), point towards the fruit of *Ravenala madagascariensis* Sonn. (Strelitziaceae). This leaves unexplained how the starchy fruit of the traveler palm would have become associated with teeth blackening and what the cause of the apparent halitosis was.

These and other matters regarding Malagasy bodily practices were addressed in more detail by Étienne de Flacourt in his *Histoire de la Grande Isle Madagascar* (1658). During the years 1648 to 1655 Flacourt gained firsthand knowledge of local customs when he was based at Fort Dauphin (today’s city of Tolañaro) and put in charge of the permanent settlement of the Compagnie Française de l’Orient, the equivalent of the Dutch Verenigde Oost-Indische Compagnie (VOC). His descriptions pertain primarily to the people of southeastern Madagascar, with a great deal of evidence collected on the Antanosy group which lived in the vicinity of the French fort (**Figure 1**).

Flacourt remarked on the process of teeth blackening as well as betel chewing in the context of a ritual feast, celebrating the breaking of a fast, which in its name **ramavaha**

(Ramadan) and its characteristics was strongly, though not solely influenced by Islamic practices (Flacourt 2007:498). In preparation for the nightlong feast, locals rinsed their mouths with hot water and then chewed a plant which Flacourt described as **bétel**. They did so in order to turn their teeth, gums and lips black (Flacourt 2007:168). The indigenous designation of Flacourt’s **bétel** was, in his transcription, **tamboure** or, as we know now, **tamboro** (or **tam-**



Figure 1. Madagascar indicating in italics locations mentioned in the text and in roman the approximate distribution of eighteen commonly recognized groups. The groups shown in black practiced teeth blackening, whereas evidence is lacking for those shown in blue. Antemoro, in brown, did not engage in teeth blackening.

⁵ Here Cauche used the designation Madegasse or Madagache to refer to a particular region, allegedly so referred to by its inhabitants, though these forms and the related appellation Madagascar for the island are most likely of European origin.

⁶ French ‘**iyett**’, which became English ‘jet’, refers to a black or dark brown geological material of organic origin also referred to as lignite.

bolo) (Flacourt 2007:208, Richardson 1885:609, Webber 1853:640).

The form **tambolo** was a loan word which in its source languages (discussed below) exclusively referenced *Piper betle* L. In Madagascar, however, the identity of **tambolo** apparently became equivocal, since it could also refer to *Buchnera leptostachya* Benth. (Orobanchaceae). This is a plant whose leaves could bring about the desired blackening of the teeth and mouth and which seems to be implicated in Flacourt's description. In a further deviation from a conventional betel quid, among Antanosy the slices of the seed of *Areca catechu* L. were replaced by **voafontsi** (Flacourt 2007:168). **Voafontsi** turns out to be the seed (**voa**, 'fruit, seed') of *R. madagascariensis* (**fontsy**; Richardson 1885:203), thus confirming Cauche's observation. These seeds were known to be edible and hence were otherwise ground up and consumed with milk (Flacourt 2007:205). Even though their bright blue aril might have evoked an association with dyeing, it is implausible that detached from their seed cover these seeds contributed anything to teeth blackening or provided any sort of physiological stimulation as is the case with areca nut. The 'betel' chew of Antanosy that Flacourt noted neither incorporated the traditional plant ingredients nor lime; it was an entirely local composition mimicking a betel quid only in appearance.

Further north along the east coast of Madagascar in the 'Seven Rivers Region', centered on the Matatãña river, both *Piper betle* L. and *Areca catechu* L. palms were cultivated for use in betel chewing (July 1905-1906:12), thus allowing areca nuts to be wrapped in betel leaves for a 'true' betel quid. Among Antemoro the preparation of betel quids, including the production of lime from **antsoara** shells, as well as the presentation of betel quids could be quite formalized (Beaujard 2006:427) and integrated into ritual processes essential to the identity of the group, such as those legitimizing royal power through connecting with the tombs of ancestors. This symbolic significance of the exchange of 'betel' quids has persisted in Antemoro culture to the present date.

There is evidence that the use of *P. betle* and *A. catechu* eventually extended beyond Antemoro territory. The Frenchman Carpeau du Saussay, who in the early eighteenth century spent two years primarily around Port Dauphin, noted that the reddening of tongue, teeth and lips with betel leaf, lime and **larach**, certainly a misprint for **l'arach** (areca nut), was considered an alternative to the use of blackening agents (du Saussay 1722:272-273). In the 1860's occasional areca palms were reported as far north as Toamasina (Meller 1863:391). However, neither

P. betle nor *A. catechu* ever naturalized in Madagascar (Kull *et al.* 2011, Supplemental Materials; Madagascar catalogue 2011), but both plants continue to be sporadically cultivated along the east coast to this date. When the supply of areca nuts was insufficient Antemoro, too, would replace **foroforo**, 'true' areca nut in their quids with the seed of **voadoro** (= **voafontsy**, *R. madagascariensis*; Beaujard 2006:424).

Malagasy Teeth Blackening Agents

Flacourt's botanical interests revealed, beyond his observations on the chewing of **bétel**, a number of other teeth blackening plants. **Ambouton** (**ambotonona**) was popular to blacken teeth, lips and gum. The small herb which he compared to 'wild flax' in France, belongs to the genus *Spermacoce* (Flacourt 2007:208; Richardson 1885:30). Explaining the apparent halitosis that Cauche associated with teeth blackening (see above), Flacourt noted **zamalo** (or **zamala**; Flacourt 2007:168, 208) as a stinking teeth blackener that was also chewed to cure ulcers of the gums and rubbed on the gums of teething children by their wet nurses. **Jamala**,⁷ in proper transcription, is an Antanosy term for *Paederia* spp., which has remained in use up to the present among Antanosy speakers (e.g., for *Paederia thouarsiana* Baill., see Tropicos.org, Randriamampionona 10 MO, Dupuy 84 TAN) and which could alternatively be referenced as **vahimantsy** (**vahy** 'creeper', **mantsina** 'stinking'; Flacourt 2007:499, 526, Robertson 1885:722).

Similarly describing *Paederia* spp. was what Flacourt referenced as **l'engou** in his manuscript. This vine carried a fruit about the size of a walnut which could be chewed to blacken teeth, lips and gums as well as to 'sweeten the breath' (Flacourt 2007:208, 526). More precisely **laingo** only generically designated the class of teeth blackeners whose identity was further defined by an epithet (Webber 1853:429).⁸ For example, certain species of *Paederia* would then be referred to as **laingomaimbo**, the 'stinking **laingo**' (**maimbo** 'stinking'; Richardson 1885:368), and **laingontsintsina** (**tsintsina** 'little bird'; Richardson 1885:368) would specify *Tetraspidium laxiflorum* Baker (Orobanchaceae). While considerable diversity in the ethnobotanical resources employed for teeth blackening is already apparent in Flacourt's account, later sources add considerably to the list of agents that were chewed or rubbed on the teeth (Table 1).

The foregoing might suggest that in Madagascar teeth blackening was methodologically only accomplished by simple chewing, but an important historical source, the **Tantara ny Andriana** ('History of the Nobles'), tells otherwise. While the **Tantara ny Andriana** primarily dealt with

⁷**Jamala** is also a widely used Malagasy term for *Cannabis sativa* L. (Cannabaceae; Richardson 1885:808), which does not apply here.

⁸From Madagascar **laingo** was loaned into the creole languages spoken on neighboring islands. **Lingo** was noted by Grant (1801:41) as the name of a vine on Mauritius in the late eighteenth century, while on Réunion **lingue** became part of a number of composite vernacular plant names for species belonging to the genera *Danais*, *Mussaenda* and *Piper* (Jacob De Cordemoy 1895:280, 494, 503-504, see also Bolleé 1993:258-259).

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Table 1. Plants attested for their use within the context of teeth blackening. Identified species are arranged in alphabetical order according to plant family. Only vernacular names from sources that make reference to teeth blackening are included. According to the type of use of the plant material the teeth blackening methods are organized into three categories: (1) Chewing or rubbing on a part of the plant (yellow overlay); (2) Heating a twig, stem or bark and applying the expelled substance (pink overlay); (3) Compounding a more complex dye from plant materials and an inorganic component (blue overlay; compare Zumbroich 2009:384, Table 1).

Species (Family)	Vernacular name	Group	Method of Use	Literature Source
<i>Spondias dulcis</i> Parkinson (Anacardiaceae)	sakoana	Tsimihety	bark chewed with mud from rice fields	Dandouau 1913a:84
<i>Sclerocarya birrea</i> (A. Rich.) Hochst. (Anacardiaceae)	sakoana	Tsimihety	bark chewed with mud from rice fields	Dandouau 1913a:84
<i>Areca catechu</i> L. (Arecaceae)	foroforo (?)	Antanosy	seeds chewed with lime	du Saussay 1722:272-273
<i>Dracaena reflexa</i> Lam. (Asparagaceae)	ranjo tavalahy	Tañala southern Sakalava	leaves chewed	Lévrier 1897:461, Richardson 1885:497
<i>Dalechampia madagascariensis</i> (Müll. Arg.) Pax & K. Hoffm. (Euphorbiaceae)	vahendrongony	Betsileo	shoots, leaves chewed	Heckel 1903:110 Richardson 1885:722
<i>Desmodium salicifolium</i> (Poir.) DC. (Fabaceae)	famolakantsy	Tsimihety	wood tar of stems applied	Dandouau 1913a:84
<i>Desmodium velutinum</i> (Willd.) DC. (Fabaceae)	sofindambo	Tsimihety	wood tar of stems applied	Dandouau 1913a:84
<i>Dionycha bojeri</i> Naudin (Melastomataceae)	bongo	Bezanozano, Merina	leaves, shoots chewed, rubbed on	Dandouau 1878-1881:192, Vallier 1898:1199
<i>Buchnera decandollei</i> Goovaerts (Orobanchaceae)	tambolondrano	?	leaves, shoots chewed	A.M.D.G. 1853:640
<i>Buchnera leptostachya</i> Benth. (Orobanchaceae)	tambolo, tamboro tamborokijoa	Antanosy, Merina and others Betsileo	leaves, shoots chewed	Flacourt 207:168, Heckel 1903, Richardson 1885:609
<i>Tetraspidium laxiflorum</i> Baker (Orobanchaceae)	laingontsintsina	southern Sakalava, southern Merina	leaves, shoots chewed	Lévrier 1897:461, Richardson 1885:368
<i>Piper betle</i> L. (Piperaceae)	tambo, tambolo	Antanosy	leaves chewed	du Saussay 1722:272-273
<i>Piper pyriforme</i> Vahl (Piperaceae)	tsimperifery	Bezanozano	shoots chewed	Vallier 1898:1199
<i>Embelia concinna</i> Baker (Primulaceae)	tanterakala	?	leaves chewed	Abinal & Malzac 1888:652
<i>Mussaenda arcuata</i> Lam. ex Poir. (Rubiaceae)	vahindaingoala	Bezanozano	leaves, shoots chewed	Vallier 1898:1199

Species (Family)	Vernacular name	Group	Method of Use	Literature Source
<i>Paederia</i> spp., e.g., <i>Paederia argentea</i> (A. Rich.) K. Schum., <i>Paederia bojeriana</i> (A. Rich. ex DC.) Drake, <i>Paederia farinosa</i> (Baker) Puff (Rubiaceae)	jamala, vahimantsy laingomaimbo, laingomantsina, (laingo)vahira tamboromantsina	Antanosy, Bara, Merina, Sakalava, Tsimihety Betsileo	fruit, but also leaves chewed	Barbier 1916-1917:73, Dandouau 1913a:84, Flacourt 2007:208, 499, Lévrier 1897:461, Richardson 1885:368, 723, Webber 1853:429
<i>Spermacoce</i> sp. (Rubiaceae)	ambotonona	Antanosy	leaves chewed	Flacourt 2007:208, Richardson 1885:30
<i>Solanum anguivi</i> Lam., <i>Solanum macrocarpon</i> L., <i>Solanum erythracanthum</i> Bojer ex Dunal (Solanaceae)	angivy, angivikely	Merina	wood tar of fruit applied	Callet 1878:123, Dandouau 1913b:191, Decary 1953:37
<i>Ravenala madagascariensis</i> Sonn. (Strelitziaceae)	fontsy	Antanosy	seeds chewed with tambolo and lime	Flacourt 2007:205
unidentified	hazombareta	Tañala	?	du Picq 1912:258
unidentified	herendry	Tañala	?	du Picq 1912:258
unidentified	laingohiaka	?	?	Webber 1853:429
unidentified	lengoroy	northern Sakalava, Tsimihety	buds chewed	Mattei 1938:137, Webber 1853:429
unidentified	motro	Tsimihety	bark chewed with mud from rice fields	Dandouau 1913a:84

the genealogical history of the Merina dynasty, these documents extended into other topics, such as **ody** ('medicine', 'charm') and **fanafody** ('counter-charms'). Under the headline '**odi-famaintisana ni nify**' ('Remedy to blacken teeth') it described how one could burn the fruits of **angiv(ikel)y** (*Solanum* spp., Solanaceae) and use an **angady** (iron spade) to condense the rising smoke. The collected **kitro** (wood tar) was then applied to the teeth (Callet 1878:123, Dandouau 1913b:191). Similarly, Tsimihety from the north-central coast of the island lit branches of **famolakantsy** or **sofindambo** (*Desmodium* spp., Fabaceae) to collect the expelled wood tar on an iron tool. Among Tsimihety and Antakarana, the black layer created when this substance had been applied to the teeth, was called **kisiky** (Dandouau 1913a:84, Velonandro 1983).

Another approach to producing **kisiky** among Tsimihety was to chew the bark of certain trees, e.g., **sakoana** (*Spondias dulcis* Parkinson or *Sclerocarya birrea* (A. Rich.) Hochst., Anacardiaceae) or **motro** (unidentified). This was complemented with a small amount of mud from the rice fields. As is typical for members of the family Anacardiaceae the bark of these trees have a high content of tannins (e.g., Orwa *et al.* 2009) which, in combination with

the characteristically iron rich soils of Madagascar, would readily form dark iron-polyphenole complexes acting as teeth blackening agents (Zumbroich 2009:391).

Patterns of Beauty

In an early description of teeth blackening, du Saussay noted that the indigenous people he had encountered did not have all their teeth blackened, but two teeth in the upper and lower jaw each remained white (du Saussay 1722:272). Given that chewing was the prevailing method of blackening, this observation is perplexing, since with chewing one cannot accomplish differential staining of teeth. An explanation is provided in the **Tantara ny Andriana** which named this ancient form of adornment **main-timbazana**, 'blackening of the molars' (**maintina** 'black', **vazana** 'molar'; Richardson 1885:407, 747) or, hinting at the method, **laniala**, 'consumed and removed' (**lany** 'consumed', **ala** 'removed'; Richardson 1885:19, 377). The patterning was accomplished by using grains of unpeeled rice to scrub off the coloring that had previously been applied to four front teeth. This left them shining white except for the interstices between teeth and the gum line which remained black (Callet 1878:123, Dandouau 1913b:191).

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Among Merina this was considered an important attribute of beauty, much like wearing a special **lamba** (traditional cloth wrap; Fox 1990:123, #54). This practice extended both east and south beyond the central highlands, with certain Tañala, Atandroy and Bezanozano (perhaps Sakalava, too) returning their central or all their incisors to a natural color after blackening (Decary 1953:37, Peake 1878:41, Pickersgill 1875:88).

Related and, where applicable, enhancing the visual effect of blackened teeth were efforts to redden the lips, but inevitably also the tongue and gums would share the reddening. Especially in preparations for celebrations some young Tañala, Antesaka and southern Betsimisaraka chewed the leaves of **fanamena** (*Danais cernua* Baker, Rubiaceae) with ashes. They would then spread the resulting deep red juice with a lemon over the lips for a tint that lasted for days (Decary 1953:37, Deschamps 1936:59). The red dye that could be extracted from various parts of this common liana is chemically based on the two anthraquinones danain and danainin and found its primary use in the coloring of traditional Malagasy textiles (Jansen 2005:73). Here as with the other forms of dental adornment both men and women participated in the practice.

Odi-hozona - Remedies against loose teeth

Malagasy people were generally quite concerned with the health of their teeth. Their goal was to maintain their teeth until they died or, in their own words, 'to keep the teeth until arriving at the tomb'. With this in mind, some would only approach a tomb while actually counting their teeth. A related **fady** (taboo) was to avoid certain activities, such as singing or looking into a mirror while eating, since this was thought to make teeth unattractively longer and, in turn, more prone to loss (Decary 1953:41, Standing 1883:252, 260).

With this set of beliefs in mind, the blackening of teeth was considered a means to preserve teeth and to firm those that were loose (e.g., Richardson 1885:368). Other remedies (**ody**) by which loosening (**hozona**, 'shaking') of the teeth could be prevented were described under the title **odi-hozona** in the **Tantara ny Andriana** (Callet 1878:123, Dandouau 1913b:191). In this category fell the filing of teeth, which has been documented among Merina, Betsileo and Antesaka (Dubois 1917:70). With the patient lying down, the crowns of the teeth were shortened with a stone or a metal file to accomplish evenness, though occasionally the operation might have been taken far enough to open the pulp cavity. In the context of teeth filing, but also otherwise as a means of preserving teeth, a poultice from the leaves of **famaho** (Merina; **falahidambo**; Betsileo; *Dichrostachys tenuifolia* Baker, Rubiaceae;) or **fihitra** (**ahitra mandady**; unidentified) pounded with salt was applied (Callet 1878:123, Dubois 1917:70).

The practice of teeth filing is ethnographically poorly documented, but there are indications that its significance went beyond aesthetic and health considerations alone. Filing the upper teeth was apparently permitted to anybody, whereas filing the lower teeth was considered a privilege of the sovereign (Standing 1883:257). Among Antesaka teeth filing was practiced around the age of ten, accompanied by a celebration during which the children were anointed with the oil of **savoia** (*Jatropha curcas* L., Euphorbiaceae; Deschamps 1936:59), pointing to a rite of passage of sorts.

Proverbs and Meanings: Teeth blackening in Malagasy oral literature

As much as it has been possible to gain an understanding of the methods and resources involved in dental modifications in Madagascar, the relative paucity of ethnographic data leaves a void in the understanding of the meanings of the practices. Fortunately, another hitherto overlooked source is available in extensive collections of Malagasy oral literature that comprise the broad category called **fitenin-drazana**, 'sayings of the ancestors' (Haring 1992:14).

The use of ornamented, riddling or otherwise patterned speech has long been a powerful force at all levels of Malagasy society. In a country that did not use written texts before the mid-nineteenth century (with few exceptions such as Antemoro, see below), oral literature in its various forms became an important, socially stabilizing repository of traditions and patterns of thought. While undoubtedly Malagasy verbal arts underwent creative changes or were adapted over time, in their appropriate reading they can nonetheless be revealing about aspects of pre-contact philosophy (e.g., Rogers 1985). If teeth blackening held, indeed, a long-standing place in Malagasy culture, one would expect the practice and the plants involved to resonate strongly in the island's heritage of oral literature.

Tsimihety sôva - Descriptive songs

Much of Malagasy oral literature presents veritable challenges in decoding, and certain genres have been considered 'more obscure to an English reader' than any other oral literature (Haring 1992:1). For this reason, I will start out with an example from a genre that is relatively more accessible than others, the **sôva** of Tsimihety (Michel-Andrianarajaka 1967, 1968:79-86). In these poetic songs typically a familiar object, animal or plant is described in almost analytical detail.

The **sôva momba ny valalanga** ('Song of the Grasshopper') begins with the following lines:

'We will describe the grasshopper.
Its head is like a grain of corn.'

...

Its teeth are black as coal.
They are black, and the grasshoppers do not [even] chew **lengo**,
very black like **kisiky**.
The **kisiky** lasts until their death.
Their saliva is like ink,
[though] at first it looks like water from rice [fields].'
(Dandouau 1913a:84-85)

This **sôva** details the different parts of the grasshopper through a series of similes, but, to the listeners surprise, diverts suddenly to what pertains to the realm of humans. Drawing an inspiration from the black mandibles of certain grasshoppers, the poet alludes to elements of the teeth blackening process as if they were actually performed by the personified insects. Grasshoppers living in the rice fields are said to blacken their 'teeth' with water which is darkened by the soil and thus turns into ink. This is an obvious reference to the use of mud from rice fields as one of the ingredients for making long-lasting **kisiky** blackener.

Ankamantatra - 'What is to be found out'

The shortest form that expresses the Malagasy appreciation of the artistic use of words is the riddle or **ankamantatra** ('what is to be found out'; Haring 1992:34). About 300 riddles were recorded on the island, with the majority being collected in the central highland region during the nineteenth century. Among them was the following:

'The honor from the forest?
The **laingo** vine!' (Ferrand 1893:256)

First of all it is notable that one of these metaphorical riddles makes specific reference to the **laingo** vine. This one-liner, like many others, demonstrates how intimately connected nature and the human world were in Malagasy figurative language (and world view). The relationship which is invoked between honor, an important value in Malagasy society, and **laingo** is expectedly cryptic, but can perhaps be understood in the following way: On the one hand, a word play is at work, since one of the Malagasy words for honor is **voninahitra**, literally 'flower of the herb' (Richardson 1885:782) which is mirrored by the flowering **laingo** vine. Further, the riddle implies the perception that using the teeth blackening plant was an important means of bestowing or maintaining honor, a fact that will be further elucidated by other material discussed below.

Ohabolana - 'Measured speech'

The literary genre that attracted the most attention and collection activity in the nineteenth century was proverbs or **ohabolana** ('measured speech'). These encompass short aphorisms informed by ancient Malagasy beliefs that often transcend 'ethnic' and social boundaries in their moral teaching (Fox 1990:47-50, Haring 1992:64). In their structure they are typically dialogic, and, even though we are here sometimes interested in what the literal statements reveal about teeth blackening, in conversations their use was almost always metaphorical.

They can have a humorous overtone, as in this first example:

"A bald man arguing over a comb, a toothless arguing over **laingo**:
no, it is not appropriate to be so."⁹ (Cousins & Parrett 1885:118, #2924)

Here a dispute by one without teeth over teeth blackener exemplifies those that are unnecessarily quarrelsome. This is a quality that can bring about 'loss of face' to other people which, in turn, is considered a shameful act (Dahl 1999:129-130).

Tambolo and **laingo** were used together and cherished so much for the purpose of blackening that they were quoted as the epitome of 'two good things adding to each other' (Cousins & Parrett 1885:120, #2986). Only 'foolish' individuals would take **laingo** and 'eat it all at once rather than rubbing their teeth with it' (Cousins & Parrett 1885:13, #301), confirming that *Paederia* spp. could also be consumed much like a vegetable (Anonymous 1898:985). In other proverbs the use of teeth blackener exemplified social norms. Convention commanded a place and time for using teeth blackener as it did for any bodily decoration. 'To search for a supply of firewood chewing **laingo**', was 'to wear an adornment hardly suitable for the activity' (Cousins & Parrett 1885:70, #1760, 143, #2473). Neglected teeth, on the other hand, would fall prey to the 'tooth worm',¹⁰ and they were 'only good to be pulled', for it was 'the only remedy'. This metaphorically described a situation where the removal or destruction of an object was the only response providing resolution (Veyrières & Méritens 1967:288, #2817).

The next examples cast further light on the motivation for teeth blackening.

⁹ Cousins & Parrett 1885:118, #2924; this and subsequent **ohabolana** were presented with a French translation and occasional commentary by Veyrières and Méritens (1967).

¹⁰ Hence 'toothache' was known as '**hanin' ny olitra**', literally, 'eaten by a worm' (Richardson 1885:458).

Zumbroich - “Ni vazana tsy aseho vahiny” - “Don’t show your molars to strangers” - Expressions of teeth blackening in Madagascar 531

‘To show one’s teeth without being provoked to laugh is to be like one who has long teeth.’ (Cousins & Parrett 1885:75, #1905)

This **ohabolana** expresses disdain for visibly prominent teeth, such as pigs would have, thus indicating that one of the objectives of teeth filing and blackening, was to make teeth visually ‘disappear’.¹¹ But, ‘to show one’s teeth’ had a meaning that went beyond the purely aesthetic dimension.

‘Ny vazana tsy aseho vahiny’

One should not show one’s molars to strangers’ (Dahl 1999:131)

This Merina metaphor expresses the Malagasy attitude towards interpersonal communication. One is encouraged to smile and be polite (‘show one’s front teeth’), but revealing inner feelings (‘one’s molars’) is censured, except when addressing intimate friends (Dahl 1999:131-134). The practice of **laniala**, i.e. the blackening of molars only, can therefore be considered a somatic reflection of the Malagasy reluctance of self-disclosure. This sheds further light on the riddle above, which characterizes **laingo** as a means to maintain one’s honor. **Laingo** not just allows one to be properly adorned, but also embodies the hiding of the ‘molars’, one’s private self, as a means of maintaining honor and acknowledgment in the community through appropriate communication.¹²

Hainteny - ‘Art of the word’

Undoubtedly the most complex of the oral genres, Merina **hainteny** incorporated profuse ornamentation with **ohabolana** as well as riddling in a poetic expression of the ‘art of the word’ that relied heavily on ambiguity and plurisignation (Haring 1992:98-102). Such **hainteny** was traditionally employed for example to demonstrate cleverness in council or in the conversations of young lovers (Fox 1990:48). Most examples of **hainteny** invoke images from the landscape of Madagascar’s highlands, known as Imerina, the land of the Merina. It is for this reason that frequently the plant life takes center stage, including those plants that were integral to teeth blackening. Inevitably these plants evoke complex metaphors, as is typical for the multi-layered style of **hainteny**.

¹¹This unwillingness to display teeth is likely one of the reasons why I have so far been unable to find a convincing visual record of blackened teeth (with the exception of a morphological study of Merina teeth which shows some isolated wisdom teeth with blackened crowns; Bajolet 1946, plate 1). Although photographic portraits of ‘ethnic types’ became a popular tool in constructing ethnicities by the French colonial administration, such images did not readily capture blackened teeth. Equally lacking are images showing blackened teeth in the photographic collections that originated in the sphere of influence of missionary work (e.g., see the International Mission Photography Archive (2011)).

¹²Yet another association between the color of the mouth and communication is evoked by the expression **mavo vava**, ‘buff mouthed’, for a person displaying clamoring, gossiping or dishonest speech (Robertson 1885:745). The color range labeled as light brown to gray is generally associated with sickness and falsehood which may explain the preference for teeth kept in a distinctly black or white color.

¹³One of the prime collectors of **hainteny** feared as much in writing: ‘In spite of all care I am still not quite sure that in some places an unnoticed impure thought may not lurk underneath...’ (Dahle 1877, vii).

‘I did not perceive the resounding tread of the moon,
I did not perceive the booming gallop of the sun.
I am a young **laingo** shoot in a rocky cleft.
Attainment is impossible,
abandonment is very easy.
That which is impossible to attain,
but very easy to abandon,
is that which is most desirable.’ (Fox 1990:177, # 134)

As is typical for **hainteny**, this poem, dealing with separation and abandonment develops parallels between the natural world and that of humans. First, the speaker laments his inability to hear the imperceptible movements of personified moon and sun across the sky. Subsequently, the speaker identifies himself repeatedly with a young **laingo** shoot. Through **laingo** the natural imagery is connected with the realm of cultured humans who would be searching out and using such teeth blackener. As the final lines reveal, the young shoot hidden within the crevices appears at once as the object of unfulfilled human desire as it symbolizes the striving for the impossible by humans in their confinement.

‘**Tapia** leaves are loved by silkworms,
tambolo leaves are loved by the teeth.
If you respect me, I will respect you,
and if you despise me, I will despise you.’ (Fox 1990:191, #153)

Silkworms love to devour the leaves of **tapia**, *Symphonia* sp. (Clusiaceae), as much as teeth ‘love’ to be adorned with the leaves of *Buchnera leptostachya* Benth. Even though in both cases, on the surface, this attraction causes the demise of its object, in both cases also a transformation towards beauty takes place through which both **tapia** and **tambolo** leaves live on. This relationship between the leaves and silkworm or teeth can therefore be considered reciprocal, if not symbiotic, as is framed from a human perspective in the subsequent verses. In the metaphorical world of **hainteny**, **tambolo** serves to bridge the blurred dividing line between human experience and nature.

Even though many of the sexually more explicit poems were purged by European missionaries during their recording of **hainteny** poetry, love poems still constitute the majority of this genre (Haring 1992:106). In the following

hainteny a veiled sexual interpretation appears to have slipped past missionary censorship.¹³

'The bud of the **laingo**, pinched, was not effective;
the good daughter, pinched, did not reply.
I am small, but I am able to restrain my speech.
I am ugly, but the handsome desire me.' (Fox 1990:129,
#63)

The opening lines of this **hainteny**, which celebrates consent and sexual union, structurally draw a parallel between **laingo** and a 'good daughter'. In an apparent pun, the bud pinched off the **laingo** plant proves just as ineffective in blackening teeth as pinching the virtuous daughter is in eliciting a response (see also Fox 1990:363, #405). **Lain-go** shoots we learn from this and another poem are 'ugly, but many pluck them' (Fox 1990:341, #369). Despite being seemingly unattractive and often foul smelling plants on the outside, by virtue of their transformative power they become the objects of desire. Unmistakably sexual overtones are evoked by the choice of words, 'bud', 'pinching' and 'desire', and the expected response must have been one of arousal. Robertson's dictionary asserts that the form **laingo** could also refer to 'female genitals' across much of Madagascar (1885:368), which would make the sexual allusions in this poem less than subtle.

Filan-ampela - 'Woman-chasing'

Further evidence for the sexualized nature of teeth blackening can be discovered in a literary genre related to **hainteny** that is known from at least one other group. Among the Sakalava in the coastal north-west of the island, **saim-bola** ('word play') found its most popular expression in erotic poems. Known as **filan-ampela** they describe 'woman-chasing', a man's advances towards a woman (Hébert 1964:227). While **hainteny** often entails dialogues between man and woman, reflecting the relatively greater equality between genders in Merina society, in Sakalava **saim-bola** it is the man alone who speaks.

In one particular type of such poetry the women of other groups are deprecated while praising the qualities of Sakalava women.

'- **lengolengo'**drohy
tengon-dreo eroy
- **kibôjibôjy** n-deo
tengo n' Amboalambo'

'- like the young leaves of **rohy**

such are the vaginas of our girls
- guts of wild pigs
are the vaginas of the Merina' (Hébert 1964:248-249)

Lengo, in its reduplication as **lengolengo**, is the Sakalava form for **laingo** (Dahl 1951:75, Robertson 1885:389). While Hébert (1964) in his translation renders **lengolengo** as 'young leaves', a different and distinctly oral association reverberates from the meaning of **lengo ro(h)y** as a teeth blackening plant (Webber 1853:429).¹⁴

In a different **saim-bola** a young man asks a wise man for his advice in 'obtaining' a woman. Interspersing some very explicit curses aimed at women that do not consent to his advances, the young man makes known his intention to chew **lengo**, presumably as an expression of his sexual appetite (Hébert 1964:250-251).

Funeral Oratory

The conspicuous burial of the dead is so central to the Malagasy system of religion and social prestige that it is fitting to conclude this exploration with an example from this realm. The funeral oratories of the Sakalava of Bemihisatra, much like their non-funerary poetry, include frank and frequent references to fertility and procreation.

A chant during the preparation for a royal funeral entails the following lines:

'**Lengolengo-droy voto ny mpanjaka**
Voto nitehoko alàna nibiribiriny
Betatabe mandriky vondreo kavaho?

'The penis of the sovereign is like the stem of the **roy** plant: it stimulates.

The penis touches the shifting sand
Is it not a large slit that will take your penis?' (Poirier 1939:69)

In a subsequent chant of the funerary cycle the male genital is similarly compared to the tip of the **roy** plant (Poirier 1939:70). The association between **lengo roy** and the male genital arose, because the stem of the plant was spiny and hence imagined to be sexually particularly stimulating (**roy** 'prickly plant'; Richardson 1885:521). It was also a plant of which the sweet fruit was particularly enjoyed by women (and children; Poirier 1939:69) and, lastly, it could be chewed for teeth blackening.

¹⁴ Webber's dictionary gives 'tender bud' for **lengolengo** (1853:430), Robertson has 'tender shoot' for **laingony** (1885:369), whereas Abinal and Malzac have two entries for **laingo**, one rendered as 'bud, tender leaves', the other as 'teeth blackening vine' (1888:362). The two meanings of the word are undoubtedly related, with the teeth blackening vine perhaps producing the tender shoots **par excellence**.

The propensity of Sakalava to make references to sex organs and procreation, either directly or by way of similes, clearly brings the sexual allusions of teeth blackening and its agents to the foreground. One must wonder to what degree associations of a similar nature have already been expunged or failed to be recognized in other genres of oral literature across Madagascar (e.g., Birkeli 1922:405-406).

Origins, Diffusion and Innovation of Malagasy Dental Practices

Teeth Blackening

To understand just how wide-spread teeth blackening used to be in Madagascar, it is instructive to map out where the practice has been recorded among eighteen ethnic groups commonly recognized in Madagascar. In this study I have found evidence that Antakarana, Antandroy, Antanosy, Bara, Betsileo, Bezanozano, Merina, Sakalava, Tañala and Tsimihety at some point engaged in teeth blackening (Table 1; Decary 1953:37; de Thuy 1898:48; Pickersgill 1875:88; Velonandro 1983). For a number of other groups (Antambahoaka, Antefasy, Antesaka, Betsimisaraka, Mahafaly, Sihanaka, Vezo) conclusive evidence is lacking. Antemoro, one of the last large groups of people to arrive in Madagascar pre-colonially, did not engage in intentional teeth blackening, though their practice of chewing betel may well have led to stained teeth as well (Figure 1).

With regards to such an analysis, one can challenge the colonial concept of perhaps arbitrarily divided 'ethnic' groups altogether. Even if accepting the existence of more or less defined groupings, sociopolitical changes would have caused significant changes in their make-up and boundaries over the four centuries covered here. Further clouding the picture is the fact that the preponderance of available information concerns the southeast and central highlands of the island, where the earliest settlements were implanted by the French or where later missionary research was focused on the center of power around the Merina capital of Antananarivo. Notwithstanding all these issues, I would maintain that teeth blackening was at some point common across much of the island, both among coastal and highland populations, with the possible exception of the central eastern coastline.

As a potential source for the practice in Madagascar, nearby Africa can be excluded, since teeth blackening was very rarely observed in the latter (Chaillu 1861:67, 75, Forde 1941:38), and, to my knowledge, not at all in coastal East Africa. In contrast, teeth blackening was widely represented among Austronesian speakers (Zumbroich 2011, Figure 3), pointing our attention to the re-

lationship between Madagascar and the Austronesian speaking world to the east.

Primarily on the basis of shared vocabulary, it has been the standard narrative that Madagascar was permanently populated between 400 and 700 C.E. by seafarers speaking an Austronesian language belonging to the South-east Barito group of Borneo (Dahl 1951). More recent archaeological, linguistic and human genetic research by no means invalidates these findings, but suggests a considerably more complex sequence of events (e.g., Adelaar 2009, Dewar & Henry 1993, Hurler *et al.* 2005, Tofanelli *et al.* 2009, Ricaut *et al.* 2009). Contacts of Austronesian speakers with the East African coast likely commenced prior to the beginning of the Common Era, leading to mutual transfers of diseases, animals, plants and aspects of material culture. Evidenced by Malay loanwords in Malagasy, and in particular so in the semantic domain of maritime technology, Malay-speaking sailors appear to have played some role in the original settlement of Madagascar in the context of continued contacts over a number of centuries (Blench 2010). While the details of the original settlement of Madagascar are far from elucidated, the participation of one or more group of Austronesian speakers from the region between southeastern Borneo and Sumatra cannot be doubted¹⁵.

The strong association between Austronesian speakers and teeth blackening on the one hand, and the dominant role of Austronesian speakers in the settlement of Madagascar on the other, raises the issue whether the practice was perhaps introduced by early settlers on the island. Linguistic evidence to support this hypothesis is hard to come by, since in Malagasy, as in the majority of Austronesian languages, no shared lexemes for the act of teeth blackening exist, but instead the process is referenced with a descriptive phrase, invoking the name of the plant involved. Yet most of the plants used for teeth blackening are endemic to the island and hence allow no comparison to those employed by other Austronesian speaking groups.

Nonetheless a plausible argument can be made for an early introduction of teeth blackening in Madagascar. The near island-wide distribution of the practice, its embeddedness in the cultural fabric of the island as well as the diversity of approaches all point to a considerable time depth of its introduction. The most commonly documented method of teeth blackening, by chewing parts of a plant, mimicked what Austronesian speakers did elsewhere, but is technologically too inexplicit to give clues to the origin of the practice. The combined chewing of tree bark with mud for teeth blackening by Tsimihety has its parallels in other Austronesian speaking groups. However, the use of **maintimpotaka** (black mud) with tannin rich tree bark

¹⁵ See the review by Beaujard 2011. A recent genetic study points towards female participation in the original colonization of Madagascar (Cox *et al.* 2012).

was not a technique unique to the blackening of teeth, but in some variations was also applied in textile dyeing (e.g., mentioned in the Merina **Tantara ny Andriana**; Callet 1878:935). On the other hand, the production of wood tar which is collected on an iron spade is the most telling approach: It is not only unique to teeth blackening, but is methodologically strikingly similar to the production of teeth blackener by other Austronesian speakers in Southeast Asia, including, e.g., Malay people as well as Southeast Barito speakers of Borneo (Ma'anyan) (Grabowsky 1883:126, Wray 1893, Zumbroich 2009:390, Figure 6).

Betel Chewing

Based on the likely origin of early settlers in Madagascar and the time frame of their arrival, one would expect them to have been familiar with betel chewing. After all this was a social practice just as deeply rooted in Austronesian speaking cultures all over Southeast Asia as teeth blackening was. While there is evidence that the first migrants to Madagascar introduced a number of important plants, such as rice (*Oryza sativa* L., Poaceae), greater yam (*Dioscorea alata* L., Dioscoreaceae), coco nut palm (*Cocos nucifera* L., Arecaceae) and turmeric (*Curcuma longa* L., Zingiberaceae) (Beaujard 2011), apparently they did not bring areca palm or betel pepper to the island. There is neither botanical nor linguistic or ethnographic evidence for an early introduction of betel chew, whether composed of areca nut and betel pepper or suitable endemic alternatives.¹⁶

In Madagascar a knowledge of betel chewing is first detectable in some of the handwritten **sorabe** texts of the Antemoro, the only group with an extensive scribal tradition before the mid-nineteenth century. Their texts were written on bark paper in different languages from Malagasy to corrupted Arabic, to a 'secret language'. One of the oldest **sorabe** texts from around 1600 contains a glossary establishing the correspondence between 'Arabic' **faofaly** and Antemoro **foroforo** as well as between **tsabolo** and **ta(m)boro** (Beaujard 1998:159, Ferrand 1904:112).

The standard Arabic form **faufal** for the seed of *A. catechu* is attested as early as the ninth century (e.g., Sābūr ibn Sahl 2009:199), but was ultimately derived from an

Indo-Aryan source (e.g., Sanskrit **pūgaphala**, 'fruit of areca tree'; Monier-Williams 1990:641) which also gave rise to Persian **pupal** (Nurse & Hinnebusch 1993:315, Steingass 1892:259). The form **ta(m)boro**, which in the **sorabe** text was related to a highly corrupted 'Arabic' **tsabolo**, originally designated *P. betle* (though would eventually also refer to *Buchnera* spp., see above). It can be traced back to Sanskrit **tāmbūla** for the leaf of *P. betle* (Monier-Williams 1990:443), which is attested from around the beginning of the common area in North India (Zumbroich 2008:118-119) and eventually in many vernacular languages of South Asia.¹⁷ The Indo-Aryan term was over time loaned across a wide geographical area beyond South Asia. **Tambula** (or **tāmbūla**) is attested in Old Javanese literature from at least the post-Majapahit period, i.e. the sixteenth century (van der Tuuk 1897-1912:2:785, Zoetmulder 1982:2:1920), and it appears in Persian as **tāmbul** (Steingass 1892:277). It was also loaned into Arabic, e.g., in Ibn al-Baiṭār al-Mālaqī's pharmacopoeia of the first half of the thirteenth century as **tāmbul** or **tāmul** (1840-1842:1:200).

The origins of the Antemoro are still far from resolved (e.g., Capredon 2012), but various pieces of evidence point towards their strong connections with the Swahili coast. The Arabic traveler Ibn Sa'īd al-Maghribī noted the presence of areca palms as early as the thirteenth century in coastal East Africa (Burton 1859:34), where betel chewing was likely practiced around this time period. Lexical analysis of the Sabaki languages spoken along the Central East African coast¹⁸ suggests a loan from a non-African source, such as Persian or Arabic, resulting in the reconstructed Proto-Sabaki forms ***tambulu** and ***popolo** for betel leaf (Nurse & Hinnebusch 1993:672). Historical linguistics only provides a rather broad time band for these loans. Proto-Sabaki differentiated after the middle of the first millennium CE, but the loan must have occurred before the loss of intervocalic // in Swahili occurred, which perhaps began in the seventeenth century (Nurse & Hinnebusch 1993:307, 314-318).¹⁹ This provides a plausible linguistic route for betel chewing lexemes (accompanying the practice) from Persian or Arabic through Swahili to Antemoro by the fifteenth century.²⁰

¹⁶ Several wild growing species of *Areca* and *Pinanga* (Arecaceae) have seeds with ruminant endosperm that are at least in appearance similar to that of *Areca catechu* L. Further, some *Piper* spp. are native to Madagascar providing plausible alternatives to *P. betle*.

¹⁷ Sanskrit **tāmbūla** itself resulted from an unexplained prefix **tām-** and a loan of perhaps Austroasiatic ***blu** or an Austronesian form (Waruno Mahdi, personal communication 2011, Zumbroich 2008:115).

¹⁸ Sabaki, named after a Kenyan river, is a linguistic label for six closely related languages of the East African littoral of which the Swahili dialects are one subgroup (Nurse & Hinnebusch 1993:4-19).

¹⁹ After the loss of intervocalic //, we find Swahili **popoo** and **tambu** (Krapf 1882:243, 356; Nurse & Hinnebusch 1993:315) with the latter giving rise to the Malagasy form **tambo** for *P. betle* (Richardson 1885:609) as a relatively late borrowing from Swahili.

²⁰ While this narrative stresses the role of Antemoro in introducing betel chewing to Madagascar, the situation likely was more complex. For example, around the thirteenth century immigrants with evidence of Indian, Sumatranese and Arabo-Swahili influence arrived in southeast Madagascar and were later displaced further south by Antemoro towards the region of Fort Dauphin (Beaujard 2007:219-220). These might have played a part in establishing the rudimentary knowledge of betel chewing later displayed there.

Although evidence of betel chewing can eventually be detected up and down the east coast of Madagascar, it never significantly penetrated Malagasy culture at large and was at times significantly modified with local substitutes bearing neither visual nor pharmacological similarity to the traditional ingredients. This stands in contrast to other islands of the West Indian Ocean, such as Zanzibar, Pemba, Reunion or Comoros (e.g., Walsh 2011:467-468), where betel chewing became culturally firmly entrenched.²¹

Teeth Filing

In Madagascar the shortening and evening out of the teeth crowns bore no similarity to the type of teeth filing which was typically done in Africa, where the frontal teeth were sharpened into a sawtooth pattern in many variations (van Rippen 1918).²² The approach taken in Madagascar, on the other hand, resulted in a similar appearance as that taken across much of island Southeast Asia. However, in Southeast Asia the ritual filing of teeth around the age of puberty was highly correlated with the beginning of a life-long practice of teeth blackening, whereas in Madagascar teeth filing was only reported for a few groups and quite unrelated to teeth blackening. While it is conceivable that teeth filing represents a remnant of a practice brought to Madagascar by Austronesian speaking settlers, it might also have arisen as a later innovation born out of a desire to shorten 'long' teeth considered undesirable.

Chewing Sticks

The use of chewing sticks made from roots, twigs and stems for dental hygiene used to be the primary approach to dental hygiene from Africa across Arabia to India (Lewis & Elvin-Lewis 2003:385-407). For example, in Zanzibar and Pemba young twigs of *Grewia glandulosa* Vahl (Malvaceae) were a popular choice for Arabic people to clean and scrub off the reddish residue left by betel chewing on their teeth (Green 1925:233). This, of course, contrasted markedly with the Malagasy practice of chewing twigs to blacken teeth. However, when Malagasy chewed on appropriate materials, such as **laingo** twigs (Dandouau 1913a:84), physical cleaning with the disaggregating fibers was perhaps a concomitant and at times desired effect of the staining process.

Conclusions

Based on the limited expression of betel chewing in Madagascar, its inclusion in the area of betel chewing (e.g., Rooney 1993:11-12, Zumbroich 2008:120-121) ought to be rethought. Madagascar remained for the most part an enclave of non-betel chewers located toward the western limit of the vast region of betel chewers that reached from Melanesia as far as East Africa. By contrast, this study provides further evidence that teeth blackening was a practice more widely distributed across the globe and culturally more intricately entrenched than has previously been acknowledged in the passing remarks devoted to it. In Madagascar the blackening and, where applicable, filing of teeth was motivated by a complex set of beliefs that included aesthetic preference, the desire to preserve teeth until the time of death, an aversion to particularly long and visible teeth and a reluctance of self-disclosure, embodied by black (molar) teeth.

Based on its wide distribution, its deep roots in Malagasy culture and the diverse array of botanical resources employed, teeth blackening appears to have been of great time depth in Madagascar. Comparison of the approaches to teeth blackening with those known from Austronesian speakers elsewhere indicates that teeth blackening in Madagascar might reflect an ancestral practice that had reached the island, if not with its nuclear settlers, then with some of its subsequent settlers from Southeast Asia which contributed to mainstream Malagasy culture. Yet, as is common in Madagascar, the teeth blackening practices that came with immigrating people were only the starting point from which the people of the island developed traditions as endemic as the spectrum of plants involved.

Malagasy oral literature emerges as a valuable source for the understanding of the cultural role of plants, especially where ethnographic data are otherwise scarce. References to betel chewing are conspicuously absent in the 'sayings of the ancestors', but teeth blackening is widely represented in a plethora of oral genres, often relating to some of the fundamental Malagasy cultural values. In addition, this literature reveals associations that were specific to teeth blackening, such as the apparent sexual connotation that accompanied the orality of the consumption of **tambolo** and **laingo**.

²¹ On the island of Mayotte of the Comores a lime kiln from the tenth to twelfth century was discovered at the necropolis of Bagamoyo that used technologies known from Austronesian speakers elsewhere. It has been speculated that its purpose was to produce very pure lime for betel chewing from the abundantly present coral (Allibert *et al.* 1983:21-22). While lime certainly had other potential uses, such as caulking for boats, later evidence indicates the continued production and storage of lime on Mayotte (Pauly 2011).

²² Flacourt hints at the possibility that in the seventeenth century in the mountainous interior a group called Ontayasatroûha might have filed their teeth in an African fashion to create '**dents aigues**' (2007:110). Later sources fail to shed further light on this observation (see also Kent 1970:45).

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