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► **To cite this version:**

Yildiz Aumeeruddy-Thomas, Verohanitra Miarivelomalala Rafidison, Finn Kjellberg, Martine Hossaert-McKey. Sacred hills of Imerina and the voyage of *Ficus lutea* Vahl (Amontana) in Madagascar. *Acta Oecologica*, 2018, 90, pp.18-27. 10.1016/j.actao.2018.04.005 . hal-02332903

HAL Id: hal-02332903

<https://hal.science/hal-02332903>

Submitted on 25 Oct 2019

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Sacred hills of Imerina and the voyage of *Ficus lutea* Vahl (Amontana) in Madagascar

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Keywords:

Ficus

Ethnobotany

Ethnology

Ecology

Symbols and power

Ficus–human mutualism

Madagascar

ABSTRACT

Humans have favored the presence of *Ficus* species within anthropogenic landscapes and near human settlements throughout the planet due to a number of beliefs and for practical purposes. An intimate or mutualistic relationship between *Ficus* spp and human societies has been suggested but explanations about the motivations of these proximities between humans and *Ficus* remain very fragmentary. The case study presented in this paper, which was conducted in the sacred hills located in the surroundings of an urban area, Antananarivo, capital city of Madagascar, inhabited by the Merina, aims at finding some answers to the following two questions. To what extent are *Ficus* species integrated into the ecologies of human groups, understood here as interactions between humans (social, political and economic dimensions)? 2) Do humans introduce *Ficus* species into new habitats, potentially offering new ecological opportunities? This study builds on initial work conducted in Madagascar in the region of Fianarantsoa in Betsileo rural communities. Results shown in this paper suggest that: 1) the kings of Imerina, the region located in the north-eastern part of the High Plateau of Madagascar, have planted *Ficus* species abundantly, especially *Ficus lutea* Vahl and *Ficus polita* Vahl, to claim ownership upon new territories of the Imerina and symbolically establish their political hegemony. Marriages with women from non-Merina cultural groups, such as the Sakalava inhabiting the Western Coast, and the use of *Ficus* species as symbols of power has contributed, with other activities, to the unification process of Madagascar; 2) The ecological distribution of *F. lutea* has been substantially manipulated by people from Imerina by planting this species quite abundantly in the sacred hills surrounding Antananarivo, an area where this species is at its ecological limit of distribution and also in faraway places such as the Western coast where the tree is not naturally distributed.

1. Introduction

The multiple interactions of *Ficus* species with human societies is related to their peculiar biological characteristics and how people perceive the latter in relation to human habits and

worldviews. *Ficus* species show a wide variety of growth forms, from huge banyan trees to epiphytes perched in trees in the rainforest or prostrate creepers that crawl on the ground. *Ficus* are widespread all over the tropics and subtropics where they occupy a greater diversity of ecological niches than probably any other woody-plant genus in the world. They play important ecological roles in forests and savannahs and are well known as keystone species for fruit-consuming animals of the rain forests (Shanahan et al., 2001). For many human communities, they are mainly known for the strangling habit of some hemi-epiphytic figs. This growth behavior has since ancient times nourished human beliefs and imagination. Strangling *Ficus* are often considered to be the home of spirits, gods, devils or symbolic representations of humans that have transformed into trees. For example, Grenand (1982) recorded among the Wayampi of French Guyana, a legend of two lovers transformed into a strangling *Ficus*. Large fig trees are also used in many villages as shelters and play central roles in village life, serving as places for social encounters, political meetings and important ritual ceremonies. Due to their versatility in life form, longevity and ecological strategies, figs can colonize and establish in many different ecological niches. They are thus collectively a major constituent of many tropical and subtropical ecosystems. Wherever humans live in the tropics and subtropics, they encounter figs and interact with them in diverse ways.

Ficus are also well known for their pollination mutualism involving enclosed inflorescences that are entered by tiny species-specific pollinating wasps. This is one of the reasons why *Ficus* have intrigued local human communities. Because fig flowers are enclosed within urnshaped inflorescences and are not visible, figs are believed to be fruits that do not originate from flowers. For example, in Mandarin the fig is called ‘wú hu? gu?’ (???) “fruit without flower” (Harrison and Shanahan, 2005). Several studies point at the importance of *Ficus* as having a central role in human founding myths. They are in that respect much more than a non-human, but rather almost a member of hybrid communities assembling humans and non-humans and have participated, due to their prior presence on the land, to the establishment of human communities (Wilson and Wilson, 2013; Kennedy, 2012; Aumeeruddy-Thomas 1994, 2018).

Our work in Madagascar, initiated in the Region of Fianarantsoa constitutes a first case study with a thorough analysis of the importance of the different *Ficus* species for the Betsileo people, one of the social groups inhabiting the High Plateau of Madagascar (Rafidison, 2013; Rafidison et al., 2016). These studies point at the importance of nine *Ficus* species that are preserved as isolated trees within agricultural landscapes and are involved in a diversity of practical and symbolic uses. Among these species, *F. lutea* Vahl is systematically referred to locally as a species of the noble families and of the kings (Hova) of the Betsileo (Rafidison, 2013). While *F. lutea* is essentially absent in the nearby forests (western, dry side of the forest that borders the High Plateau to the East), it becomes more abundant in the agricultural lands located on the High Plateau, where it is planted, and near cliffs where it germinates. The trees are also planted or germinate naturally near the tombs of ancient Hova families. Local discourse, as analyzed by Rafidison (2013) and Rafidison et al. (2016), suggest that they may have been introduced into the area by the Merina while annexing the Betsileo during the 18th and 19th century, using the tree as a symbol to signify the allegiance of local noble Betsileo representatives (Hova). The latter are known to have become intermediaries between Betsileo communities and the central Merina government, especially for collecting taxes and exerting other administrative functions.

Moreover while travelling in Madagascar and given our interest in *Ficus*, people on the road, in small villages, and children systematically chanted a small poem which goes as follows Isa ny Amontana (one, *F. lutea*), Roa ny Avi Avi (two, *F. polita* Vahl), Telo fangady (three *Sida rhombifolia* or Angady, the typical Malagasy agrarian tool used in rice fields), etc. This poem is used in all schools in Madagascar for children to learn to count (Razafiarivony, 2006). We presume that it was produced in Madagascar during the Merina Kingdom period as a means of

associating these two *Ficus* species to royalty, and that it was dispersed throughout Madagascar during the French colonial period. Indeed, during the 19th century the Kingdom of Madagascar produced a highly developed public school system which was, however, only accessible to Antananarivo noble classes, the Andriana. The French colonial authority (1896–1960) steadily expanded the education system in Madagascar into more remote and rural communities while the latter were coming under increased control of the state (https://en.wikipedia.org/wiki/Education_in_Madagascar).

The role attributed to *Ficus* species by the Merina in learning processes for children in Madagascar, led us to start a study at the heart of the Merina territory in Antananarivo and in the surrounding hills known as sacred (Hasina or Masina) hills and which were inhabited by members of the Royal Merina families. Hasina means sacredness associated to ancestors and Masina is an adjective meaning who possesses the Hasina (Blanchy and Andriamampianina, 2001).

Ficus lutea is assumed to be native to Madagascar but it is also widespread and abundant throughout Africa. To give a measure of its large distribution, the herbarium of the Museum of Natural History in Paris (P), contains specimens from 21 African countries. It belongs to section Galoglychia which is almost exclusively restricted to Africa and Indian Ocean islands (Berg and Wiebes, 1992). Furthermore, its two closest relatives, *F. saussureana* DC and *F. chlamydocarpa* Mildbr. & Burret, are restricted to Africa, suggesting that *F. lutea* originated in Africa and colonized Madagascar subsequently (Berg and Wiebes, 1992). *Ficus lutea* is a species of humid forests and gallery forests, but it is often planted outside its natural habitat (Berg and Wiebes, 1992; Compton, 1990; Diop, 2013; Burrows and Burrows, 2003).

The major objective of this contribution is to bring new elements to answer the following two questions:

- 1) To what extent are *Ficus* species integrated into the ecology of human groups, understood here as interactions between humans (involving social, political and economic dimensions)?
- 2) Do humans introduce *Ficus* species into new habitats, potentially offering new ecological opportunities?

2. Material and methods

We made a series of field surveys in Madagascar in 2006, 2007, 2008 and 2009. During these trips we conducted ethnological and ethnobotanical surveys, collected samples of many *Ficus* individuals for the purpose of a large genetic study (results not shown in this paper) as well as samples of ripe fruit odors and fig wasps for chemical ecology analyses. Observation of fig wasps and seedlings on the different sites also helped to document that the species could set seeds naturally.

2.1. Study areas

We surveyed the occurrence of *F. lutea* in many localities in Madagascar. However, the northern part of Madagascar and the southernmost part were not explored. Major surveys focused on the ecological forest corridor that links Ranomafana National Park to Andringitra National park along a mountain ridge that runs, almost uninterrupted, along the Eastern coast of Madagascar. Fig. 1 shows the distribution of *F. lutea* specimens collected by our team in Madagascar, in agrarian landscapes, in the forest corridor mentioned above and in the sacred hills near Antananarivo (Fig. 1). We also visited some places on the Eastern coast including Tamatave (Toamasina) and Andasibe, and on the Western Coast, Tulear (Toliary) and Majunga (Mahajanga). Names in parentheses refer to Malagasy names that are currently used in Madagascar. Due to the influence in the Indian Ocean of the SouthEast Trade winds, all areas located on the eastern side of this mountain ridge, from the top to the coast, present high levels of humidity (rainfall range from 1500 to 2400 mm) and the natural vegetation consists of humid

tropical forests. The mountain ridge borders to the west the High Plateau of Madagascar that is comparatively drier. Climatic conditions become drier (rainfall is less than 1300 mm) with vegetation characterized as dry tropical savannahs and deciduous tropical forests all the way to the western coast of Madagascar (Moat and Smith, 2007).

Our study sites are a series of hills that were the dwelling places of the ancient kings of Imerina, the region located in the North Eastern part of the High Plateau of Madagascar inhabited by the social group known as Merina (Fig. 2).

2.2. People and history

Madagascar was initially colonized by Austronesian migrations in two phases, first around 2000 B.C. and later between 1500 and 700 B.C. as well as by migrations from East Africa around 1000 B.C., followed by intrusions by Persians and Arabs for trade in the 9th century (Stiles, 1992). Genetic studies of the Malagasy people confirm an admixture of African and Indonesian genetic backgrounds among the people of Madagascar (Hurles et al., 2005). All social groups in Madagascar including the Merina and Betsileo of the High Plateau as well as coastal groups such as the Vezo, present strong Austronesian influences including in the language which is very close to some languages found in Borneo, as well as an admixed culture involving African traits as well as linguistic traits of Swahili and Bantu origin (Hurles et al., 2005).

Madagascar has known a long period (1500–1895) with continuous conflicts and wars between different kingdoms. The kingdom of the

- *F. lutea*, our samples
- *F. lutea*, Tropicos
- *F. menabeensis*, Tropicos
- *F. polita*, Tropicos
- *F. reflexa*, Tropicos
- *F. trichoclada*, Tropicos

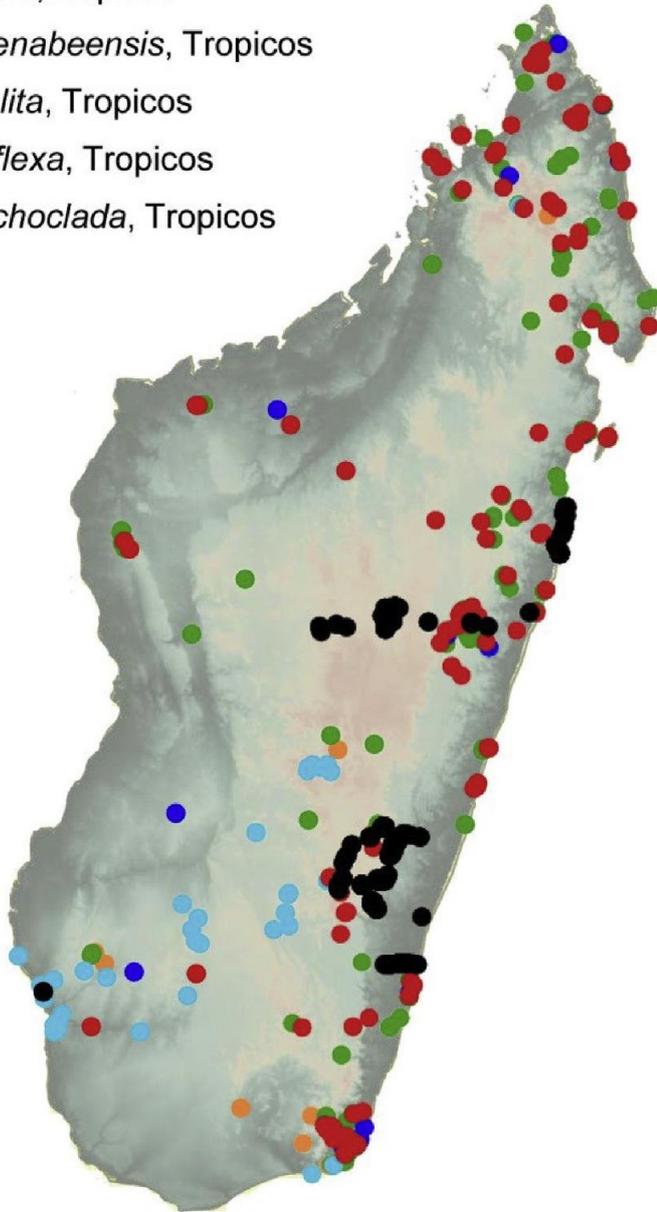


Fig. 1. Map of Madagascar showing the areas where *F. lutea* was collected by our research team as well as the distributions of some *Ficus* species according to the samples recorded in the Tropicos database (Tropicos, botanical information system at the Missouri Botanical Garden - www.tropicos.org) Author: Finn Kjellberg.

Sakalava located on the western coast of Madagascar engaged in fierce wars against the kingdoms of Merina and Betsileo, the two large kingdoms that occupied the High Plateau. The Merina king Andrianampoinimerina, who reigned between 1787 and 1810, unified Madagascar by annexing the different kingdoms with the help of his son Radama I who succeeded his father (Callet, 1875). Genealogies of the different kingdoms show that matrimonial and slavery exchanges or trade took place between the different kingdoms, such as between the Sakalava, the Merina and the Betsileo (Callet, 1875).

2.3. Specific sites and sampling of *Ficus* species

In each of the hills visited, we tried to collect samples of all individuals of *F. lutea* that were present. Among the 12 sacred hills and the dwellings known as Rova, which are of major importance for Merina royal families, we surveyed in more detail the hills indicated in Table 1 that were characterized by the specific kings and queens that inhabited them (Table 1).

All *Ficus* species of Madagascar that were collected were identified and compared to the herbarium samples at the Museum of Natural History in Paris (P), at FOFIFA (TEF) and the Tsimbazaza Herbarium (TAN) in Tananarive. We used these data to develop a field identification guide of the *Ficus* species of Madagascar (Rafidison et al., 2011). Voucher specimens of the three *Ficus* species have been deposited at Tsimbazaza and MNHN in Paris, by Julien Renoult. The following numbers correspond to voucher specimens of the main *Ficus* species that we studied: *F. reflexa* Thunb Renoult J. Ma07-182 (P), *F. lutea* Renoult J. Ma07-250 (P), *F. polita* Renoult J. Ma07-334 (P).

Our observations suggested that *F. lutea* and *F. polita* are naturally associated with the rainforest that borders the East of Madagascar and that they have been introduced elsewhere. In order to confirm this hypothesis we plotted all recent samples of a number of *Ficus* species (*F. lutea*, *F. menabeensis* Perrier, *F. polita*, *F. reflexa* and *F. trichoclada* Baker) available through the Tropicos database, including some species that are not associated with rainforest. This allowed us to examine whether lack of sampling of *F. lutea* and *F. polita* in some regions was due to lack of *Ficus* sampling or to the absence of these two species. For Madagascar, the Tropicos database mainly includes surveys done by the Missouri Botanical Garden and recent data from Madagascar correspond to wild growing plants (See Fig. 1).

The samples mainly correspond to naturally germinated individuals in semi-natural habitats. Fig. 1 shows that *F. lutea* is mainly concentrated in humid regions, along the east coast and in the north of Madagascar, as opposed for instance to *F. menabeensis* and *F. trichoclada*, species typical of drier regions and concentrated in southern, central and western Madagascar.

2.4. Ethnological and ethnobotanical surveys

The ethnological and ethnobotanical surveys consisted of semistructured interviews that were conducted systematically with all the caretakers and gardeners of each specific Rova (royal settlement) that was visited. Our researches permit N° 05/09/MEFT/SG/DGEF/DSAP/ SSE of 07 January 2009 included permission for ethnobotanical work on *Ficus* in Madagascar as well as authorization to collect samples for genetic analysis. Furthermore the purpose of our work was extensively explained to major informants and Prior Informed Consent was obtained orally. We did not ask for written consent because we were in a cultural context where orality is a major means of knowledge transmission that cannot be reduced to a signature, besides the fact that writing or signing a paper raises other cultural issues, including the extent to which a signature can be used for purposes that people may not control or understand.

We conducted field surveys with the help of caretakers or gardeners of each site in order to identify the status of *Ficus* species that were present and to collect samples. Some sites such as Rova Ambohimanga (Hill 2) were repeatedly visited between 2007 and 2009 each year. Data were also collected through listening to different speeches and through observations during public rituals and celebrations.

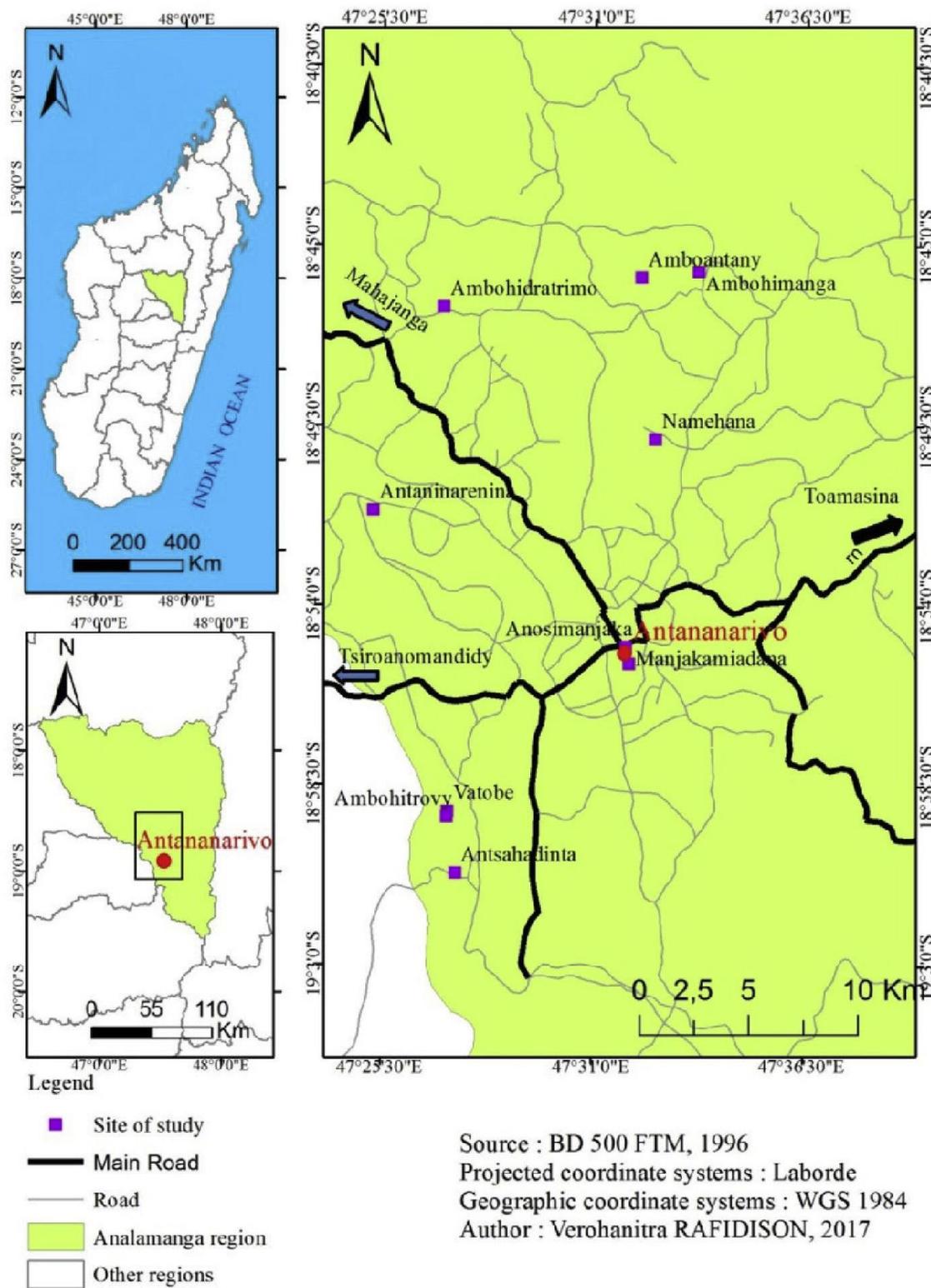


Fig. 2. Map showing the region of Antananarivo and the location of the sacred hills that we visited.

We attended specific events such as the Alahamadibe (Hill 7), the celebration of the national day of Madagascar in Anosimanjaka, where there are contemporary houses of the kinfolk of royal families as well as the tomb of Ravalona (Ravalona is a short name for her real name which was Ranavalotsimitoviaminandriana), grand-mother of Andrianampoinimerina. At Anosimanjaka, we interviewed the kinfolk of the Merina royal families as well as an elderly

key person who led the Alahamadibe ceremony and who gave a detailed oral account of the history of the place. The ceremony at Alahamadibe brings together every year members of the different royal families of Madagascar including the Sakalava, the cultural group that inhabits the region of Mahajunga which we visited in 2009 and where we also met a diviner of the Sakalava kings who was introduced to us by colleagues from the University of Mahajunga, themselves also members of the Sakalava group. Such persons are well-known in the town of Mahajunga and are easily identified by the specific ceremonial dresses they wear as well as by the fact that they carry a special stick that represents their status and power. Following the Alahamadibe ceremony, zebus (*Bos taurus indicus*) are sacrificed and rituals of trances (tromba) may take place in different places in the region of Antananarivo. We followed the end of this ceremony at Ambohimanga (Hill 2) in 2008. The following year, we were able to attend and follow in greater detail a similar ritual at Ambohidrabiby (Hill 1) and interviewed briefly the chief of the ceremony.

Many of our interviewees referred to history and relied partly on oral memory although most of them also referred to books and official accounts learnt at school. We did not cross-check elements of oral history and popular history with elements from the vast literature on the history of the kings of Madagascar. Our focus was on the current vision of oral history seen as ethno-historical accounts of how people

Table 1

List of sacred hills visited, their names and notes giving some information on the kings and relatives who inhabited these hills.

Hill 1 Rova Ambohidrabiby Inhabited during the 16th and 17th century by King Ralambo who lived there.
 Hill 2 Rova Ambohimanga King Andrianampoinimerina who unified Madagascar, lived there in the 18 and 19th century
 Hill 3 Rova Manjakamiadana-Antananarivo The latest Malagasy queen Ravalona III lived there from 1883 to 1897. Andrianjaka and Andriamasinavalona inhabited this hill previously. This hill is located at the highest point of Antananarivo (1500 m asl).
 Hill 4 Rova Antsahadinta Rabodozafimanjaka, one of the twelve wives of Andrianampoinimerina, lived there in the 18th century
 Hill 5 Rova Amboantany Andriamaheritsialaintany, brother of Andrianampoinimerina, lived there and ultimately one of his wives established there
 Hill 6 Rova Ambohidratrimo King Andriamasinavalona, father of Andrianampoinimerina, lived there and ultimately one of his wives established there
 Hill 7 Rova Anosimanjaka Ravalalotsimitoviaminandriana (known as Ravalona), grand- mother of Ravalona I, the niece of Andrianampoinimerina, lived there



Fig. 3. Goggle earth images showing two of the hills that were surveyed. Left: Ambohimanga (Hill 2), Right: Antsahadinta (Hill 4).

who effectively use these sites today refer to the past to explain the present and especially the presence of *Ficus* species and the contemporaneous practices surrounding these trees. At each site, elements of the official history of the site are portrayed on panels and genealogies that we recorded by photography.

All major interviews were recorded and translated. They are available in their original Malagasy form at CEFÉ and at the University of Antananarivo in the form of ethnographic audio-archives with dates and places (similarly to our herbarium samples).

3. Results

3.1. Royal speech, public places, zebu sacrifices and *F. lutea*

The different hills visited differ slightly in their internal organization but they all share a common structure. All the hills contrast strongly with surrounding agricultural lands by having a zone of dense forest on the slopes (Fig. 3). The altitude of these hills varies between 1200 and 1500 m above sea level.

For all the hills, the royal houses and tombs are located on the top. Every site generally also comprises a zebu park and is surrounded by highly organized ornamental gardens. Below this level or more or less at the same level is found a large open area known as Fidassina, the public area where people assembled for ceremonies to listen to the king's speech. In Ambohimanga (Hill 2), Andrianampoinimerina had a specific place where he stood, exactly under the largest and highest *F. lutea* (Amontana) that dominates the Fidassina (Fig. 4) that we identify below (our designation, to differentiate from others) as Amontana Andrianampoinimerina due to its specific status. In Ambohimanga (Hill 2), the Fidassina is surrounded by 5 or 6 large *F. lutea* and *polita* (Amontana and Avi-avi); the latter is found above the Fidassina below the walls of the King's house.

All Rova have a specific place where zebu sacrifices are conducted. In Ambohimanga (Hill 2), a specific stone, named Batu Hasina or sacred stone, is entangled within the roots of the Amontana Andrianampoinimerina. Close to this sacred stone, a larger stone has been placed (and recently replaced) also seen as Hasina i.e. sacred (Fig. 4) where the sacrificed zebu is cut into pieces after the ceremony.

According to the caretaker of Rova Ambohimanga (Hill 2), in ancient days, after the zebu sacrifice, the king used to keep the portions located near the tail as well as the zebu hump, while the heart belonged to the person who killed the zebu and all other portions were distributed in small parts to the people. Today people who order zebu sacrifices still share with the assembly because eating this meat represents a means of reinforcing social bonds known as Fihavanana. The zebu itself needs to have a special coat color, mainly brown (to red) with white spots in specific parts. These colors are highly symbolic; brown (to red) represents the royal lineages, while white represents the people. Strict food taboos have to be respected in this area; it is in particular strictly forbidden to eat pig meat before entering this place. Today, zebu sacrifices still take place in all Rova for special

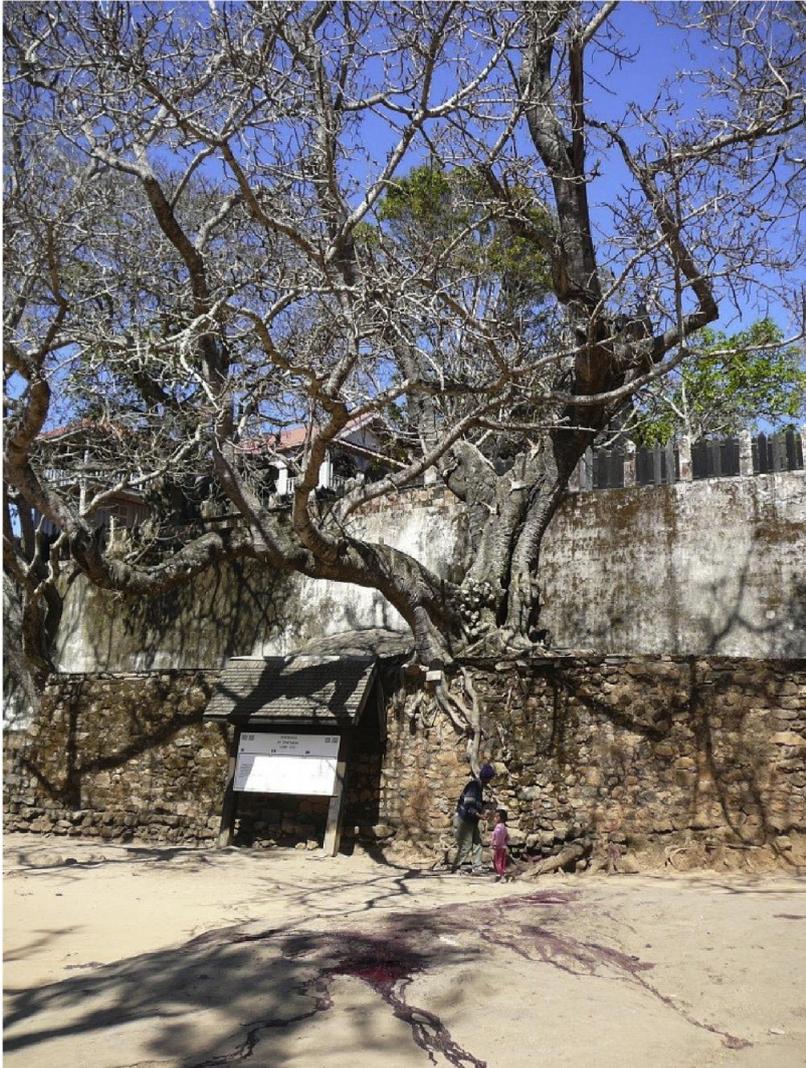


Fig. 4. The *F. lutea* under which Andrianampoinimerina gave his official speeches. Below the tree, within the roots that reach the ground is found the sacred sacrificial stone, and in the forefront a larger stone where the sacrificed zebu is cut into pieces. Photo: Yildiz Aumeeruddy-Thomas, January 2009.

occasions, such as the day of Alahamadibe. Once the ceremony is finished, the skulls of the zebu (1, 3, 5 up to 7 zebus may be sacrificed at a time) may be placed in the small “cold” (meaning empty) house that surmounts some king's tomb such as in Rova Antsahadinta. In Ambohimanga (Hill 2). Zebu sacrifices are led by specialists of tromba. Tromba are healing and social rituals which are widespread throughout Madagascar. People assemble with music and dances with the aim of requesting ancestral spirits to take possession of their body through trances (Ottino, 1965; Blanchy and Andriamampianina, 2001). The chiefs of such ceremonies have the capacity to speak with the spirits of the ancient kings and queens. The latter are known in Madagascar to be the best intermediaries between people who wish to make special requests, generally for the healing of a member of their family. In Ambohimanga (Hill 2), the tromba ceremony takes place down-hill, in the house of the women who leads the tromba, although the zebus are killed



Fig. 5. Skulls of zebus sacrificed by groups coming from Reunion or Mauritius islands, placed on the trunk of the *F. lutea* tree. Photo: Yildiz AumeeruddyThomas, January 2009.

under Amontana (*F. lutea*) Andrianampoinimerina on the sacred stones. All the skulls of the zebu are brought to the house of the chief of the ceremony or to the houses of the people who requested the ceremony. The sites are also visited annually by descendants of Malagasy slaves that were sold by the Malagasy to the French; they come from distant islands, including Reunion and Mauritius. In that particular case, and in Ambohimanga, the skulls are placed on the Amontana Andrianampoinimerina (Fig. 5).

In Ambohidrabiby (Hill 1), we attended a tromba ceremony and followed the activity of a group of people coming from Reunion Island. The woman who led the ceremony and who was also the caretaker of the Rova, showed us a number of *F. polita* trees (*Avi-avi*) growing spontaneously in the surrounding secondary forest. Yet, as compared to Ambohimanga (Hill 2), *F. lutea* was not present on the site although the tree is represented as a central part of the genealogy of the kings shown in a nearby hall (Fig. 6).

This woman showed us two young plants of Amontana (*F. lutea*) that she had planted herself within the Fidassina where the tromba ceremony had taken place. She explained that this element was missing in this place and that their plantation was meant to favor the presence of the kings' and queens' spirits.

3.2. Twelve wives and twelve hills: *F. lutea* and *F. polita* as symbols of power and fecundity

In the center of the public place (Fidassina) at Ambohimanga (Hill 2), there is one large Amontana located almost in the middle. Twelve stones have been inserted within its roots; they symbolically represent the 12 wives and concubines of Andrianampoinimerina (Fig. 7). The belief about these stones is that the 12 wives, each of which lived in one of the 12 sacred hills of the region (including the first wife in Ambohimanga-Hill 2), sat during some ceremonies on these 12 stones together, to listen to their King's speech. The key idea that prevails in this perception of the specific role of this *F. lutea* and its linkage to the 12 wives is that having so many wives would have been a main strategy used by Andrianampoinimerina to conquer, in the first place, the whole of the Imerina, sometimes at the expense of his close kinsmen. Our interviewees constantly referred to stories in which Andrianampoinimerina fought his cousins, uncles, and possibly his own father who inhabited the other hills with the objective of replacing each of them by one of his wives in each of these hills. He would have brought *F. lutea* from Ambohimanga (Hill 2), and planted this tree in all these sites to symbolize his control over these new hills. At Rova Antsahadinta (Hill 4), for example, Rabuzafymanzaka, one of the wives of Andrianampoinimerina, gave birth to Radama I. This wife, according to different stories, replaced an uncle that he had fought.

Anosymanzaka (Hill 7) was founded by queen Ravalotsimitoviaminandriana currently known as Ravalona, grandmother of the niece of Andrianampoinimerina (Ravalona who became queen of Madagascar after her husband, Radama I). The legend, as it was told to us by the person who opened the ceremony at Alamatibe, says that she had a faithful servant of Antehiroka origin. The Antehiroka are a lineage (Taranaka) inhabiting the region of Antananarivo. It is the role of this specific group to serve the queen. They are known to be specialized in the rituals of circumcision for the royal family and are still today the ones who open all ceremonies. They are also endowed with the power of making the rituals of the first harvest of rice which is still deposited today by an Antehiroka at the different Rova, as we could observe at Ambohimanga, Hill 2. Her Antehiroka helper travelled with her across the marshes and rivers on a raft made of Cyperus wood and Nymphaea with the help of crocodiles, and reached this "island" or hill (at present Anosimanjaka). It is commonly said that he is the person that she trusted most and was very close to her.

At her arrival she found a place where there were Nymphaea and ferns as well as *F. polita* (Avi-avi) growing naturally. She decided to stay there because of the presence of this tree. According to our informant, in the history of Madagascar it is a general belief that Amontana (*F. lutea*) and Avi-avi (*F. polita*) are "Hasina", that is, they are endowed with positive natural powers. It is therefore appropriate for kings and queens to establish their residence near such trees. The queen's tomb in Anosimanjaka (Hill 7) is also planted with a *F. lutea*. Several *F. polita* are found in the gardens of surrounding houses that belong to kinfolk of the royal family. Anosimanjaka (Hill 7) was an important fief of Andrianampoinimerina that he obtained with the help of the grandmother of his niece (Ravalona I), also the wife of his son. It still represents an important area due to the presence of Ravalona's tomb and also symbolizes the unification of Madagascar through the ceremony of Alahamatibe that assembles all the kings and queens of Madagascar.

A series of steles (stones planted vertically in the soil) with no trees associated with them symbolize in this place the appropriation of this territory by Queen Ravalona.

In Antsahadinta (Hill 4), where we could see Amontana (*F. lutea*) germinating naturally on other trees, the most important feature that emerged from discussions with the caretaker, is that it embraces a Hasina, *Draceana reflexa* Lam. (Asparagaceae), a tree whose Malagasy name signifies "sacredness". The fact that two different species are interwoven (due to the hemiepiphytic nature of *F. lutea*) without one killing each other is interpreted as a marriage

between the two trees. Amontana (*F. lutea*) also germinates on large *Brachylaena merana* (Baker) Humbert (*Asteraceae*) specimens without affecting that tree, which incidentally also has major functions because of its very hard wood. Near the tomb of Rabodozafimanjaka, wife of Andrianampoinimerina in Antsahadinta (Hill 4), there are two *F. polita* and one large *Brachylaena merana*. These associations are mobilized in people's perceptions and beliefs as symbols of long life for young lovers.

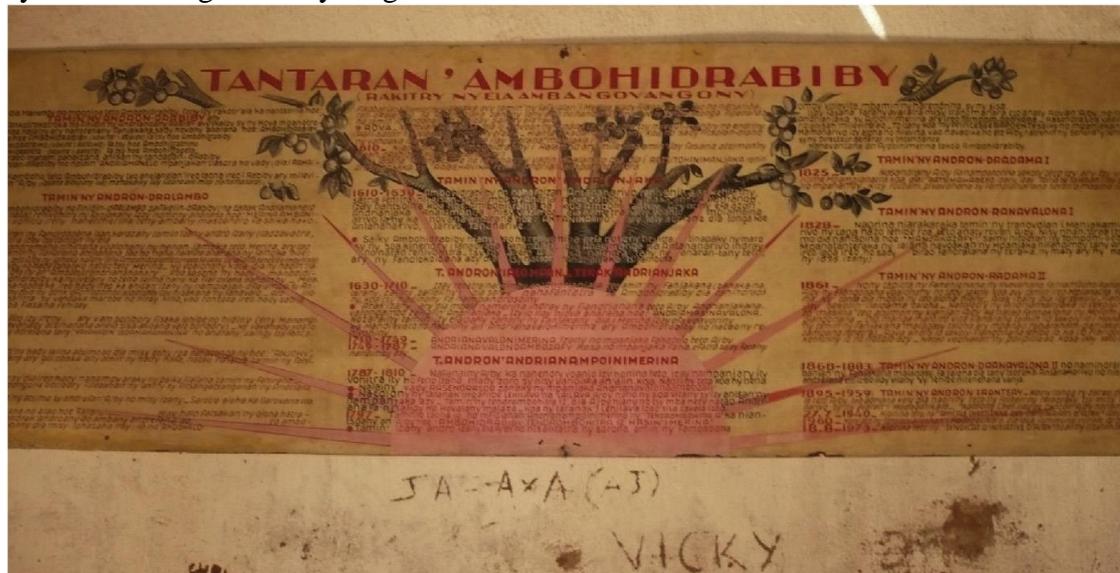


Fig. 6. The history of Ambohidrabiby (Hill 1) portrayed with an Amontana (*F. lutea*) in the central part. Photo: Yildiz Aumeeruddy-Thomas, January 2009.

In Rova Antsahadinta (Hill 4), Rabodozafimanjaka, the wife of Andrianampoinimerina, mother of Radama I, is well-known to have taken much care of her children. Another *Ficus* species present on this site, *F. reflexa* (Nunuka) is referred to having been an important asset because infusions of the leaves help breast-feeding of babies. Nunuka literally means women's breast and is well-known throughout Madagascar to have this function. In addition, in all the hills visited, latex of Amontana (*F. lutea*) is used to heal wounds. Avi-avi (*F. polita*) is also a medicinal plant that combats coughs (infusion of leaves) and nonmature fruits are used to clear the throat before singing. Because singing is a very important activity in Madagascar, fruits of Avi-avi (*F. polita*) are collected and sold in markets

The major feature of the Rova Andoantany (Hill 5) is the presence in its central garden of two exceptional individuals of Amontana and Aviavi that grow side by side. According to the caretaker, all women who wish to have a baby can come directly here to make wishes and attach a small piece of cloth to their branches.

3.3. The legendary voyage of *F. lutea*, land appropriation and invincibility

Local belief about the presence of Amontana in Ambohimanga (Hill 2) is that it was brought to this hill from Lasur (located 100 km north of Antananarivo), the village of origin of the father of Andrianampoinimerina. The following scenario of the origin of *F. lutea* was presented to us by several persons: the Merina came from the East and travelled from one place to another where they planted this tree to appropriate new lands as well as to symbolize the presence of the tombs of their ancestors.



Fig. 7. *Ficus lutea* (Amontana). Stones within its roots symbolically represent the place where the twelve wives used to sit. Drawing made from an original photo, January 2007, Y Aumeeruddy-Thomas.

The importance of *F. lutea* and *F. polita* in augmenting the power and sacredness of the royal families is mediated by the idea that cutting *F. lutea* and *F. polita* may have supernatural impacts. It is said that whoever cuts them will be struck by lightning. Some popular accounts report that this kind of event has effectively happened at Antsahadinta (Hill 4). Similarly at the Queen's palace, Hova Manjakamiadana (Hill 3) in Antananarivo which is a UNESCO World Heritage site, it was deemed that the *F. lutea* trees that grew there could affect the buildings seen as an important heritage to preserve. The cutting of all the Amontana (*F. lutea*) would have coincided with an important fire that destroyed parts of the building. Many seedlings of *F. lutea* are found growing in the walls around the palace and the tree has been systematically re-planted in the Rova garden.

The association of the supernatural power of *Ficus* species with the royal family is enforced through the fact that ordinary people should not, or are discouraged from planting them on their lands so that they remain fully associated with members of the royal family.

Two other names are sometimes given to them especially by Mpsikidy, a type of Malagasy diviner. *Ficus polita* is named Mandresy, meaning "he who gains all battles", while *F. lutea* is named Tsiresy meaning "the one that is never beaten". This vision is associated with the fact that these trees and especially *F. lutea* grow on rocks in high areas, a symbol of strong power and invincibility in analogy with the king's own power.

Finally, another legend says that Amontana (*F. lutea*) saved the life of Andrianampoinimerina because it is a deciduous tree that loses all its leaves in winter. Walking on these leaves makes a special sound. Once, the Sakalava tried to attack the king and were beaten into retreat as the sound that they made while walking on the leaves drew the attention of the Merina. Legend or

reality, this portrays a strong association between the king and *F. Lutea*, as a military strategy that provided, if not invincibility, but the capacity to dominate other kingdoms.

Regarding the question of whether *F. lutea* has effectively been abundantly planted, or whether it already grew naturally on the hills, we identified during our explorations of the dense secondary forests which cover the slopes of the hills that *F. lutea* is almost absent from the forest. The caretaker explained that the few seedlings or individuals that were found in the forest had been dispersed by animals from fruits coming from the older individuals that had been planted. On the other hand, *F. polita* reproduces abundantly in these forests. Similarly, in Antsahadinta (Hill 4), there is a higher density of *F. polita* in the secondary forests surrounding the hill. A few individuals of *F. lutea* were observed germinating on other trees as typical hemi-epiphytes. However in the gardens located in the upper parts of the hill, all individuals had been planted. Lately, the Ministry of Culture and a local association have launched a program of plantation of local forest trees including these two *Ficus* species. 4.

Discussion and conclusion

4.1. The distribution of *Ficus lutea*

The distribution of different *Ficus* species compiled in Fig. 1, suggests that *F. lutea* was originally concentrated on the eastern side of Madagascar, where forest is present. This is in agreement with diverse statements in the literature for continental Africa associating *F. lutea* with forest habitats. *Ficus lutea* is unlikely to be limited by lack of favorable germination sites outside this zone as we observed it to readily establish on rocks as a lithophyte in deforested eastern habitats. Hence, the association with humid forest is probably due to difficult establishment of seedlings outside this zone due to climatic conditions. *Ficus lutea* in the surrounding of Antananarivo, may sometimes grow by seedlings, but it seems to have a problematic reproduction as we observed figs outside the forest to often dry up without releasing fig wasps.

At the end of our account of local beliefs and concrete practices associated with *F. lutea*, and acknowledging that the kings of Madagascar have effectively planted these trees or favored their presence where they lived, we may still wonder whether *F. lutea* has been brought to Antananarivo or whether it was already growing in that area. As shown in the map based on the Tropicos database (Fig. 3), *F. lutea* is mainly found on the eastern side of the mountain ridge that stretches all along east Madagascar, under a climate favorable for rainforest. Yet we also observed it to grow on cliffs within agricultural lands of the High Plateau. It is furthermore planted in agricultural lands and is absent from adjoining dry forests of the western drier parts of the ridge (Rafidison, 2013). In Ambohimanga (Hill 1) and the Rova of Manjakamiadana-Antananarivo (Hill 3), it may grow naturally, but is rare in the forests. In Antsahadinta (Hill 4), we have seen different specimens growing on other trees. Yet they are also planted there as well as in the gardens. In Ambohimanga (Hill 2), the caretaker, whom we met at least four times over four years, thinks, based on his own observations, that the tree has difficulty to regenerate. He showed a series of fruits that he opened to explain that they often have what he calls ants which parasitize the fruits, and he thought that this was the reason why the fruits did not reach maturity. His account is that the fruits of *F. lutea* show this specific habit of not reaching maturity every year. By inference, we have deduced that the figs were not properly pollinated even though a few pollinated figs seem to have reached maturity and delivered mature seeds that eventually developed into seedlings.

All information seems to converge to suggest that there may be two factors determining the presence of *F. lutea* in Antananarivo. Its growth would have been favored by the kings who have probably travelled with their *F. lutea* to mark the tombs of their ancestors and appropriate new lands, a practice also well-known in other areas of Africa (Dury, 1991; Gautier, 1996). They are also probably at the limit of their distribution area; this would explain that they may

grow when forest conditions are favorable such as in Antsahadinta, Hill 4 (this place name means “the place where there are many leeches”) which is known to be a very humid place.

In Tulear, on the western coast where this species has been collected, it was growing very precisely in a garden near the beach, a long distance from its natural habitat (Julien Renoult pers. com., 2016). Our visit in Majunga showed that there were no signs of any *F. lutea*. Yet a botanist acknowledged that it was growing in a Rova of a Merina princess who married a Sakalava.

It is thus very clear that the Merina did travel with *F. lutea* and have contributed to the dispersal of this tree beyond its natural distribution.

4.2. Hasina or sacredness

Sacrificial practices at the Rova of Ambohimanga (Hill 1) are conducted within well-defined places and link people, zebu, rocks and trees, politically and socially, within strict social hierarchies that incorporate trees almost as members of society. These linkages indeed directly affect people's lives through many entangled activities linking *Ficus* to people. These ceremonies mobilize interactions between people, stones, zebu, trees and ancestors within a conception of power and sacredness that is important in Madagascar, the concept of Hasina. It has been interpreted by scholars as the mystical power of nature and of reproduction which ensures life from generation to generation (Bloch, 1971; Raison-Jourde, 1983; Blanchy and Andriamampianina, 2001). The kings of Madagascar in that regard have the highest level of Hasina and possess all the adequate symbols and talisman. *Ficus lutea* and *F. polita* were considered Hasina by the people of Madagascar, possibly before the advent of the kings during the feudal period. The latter however have attached these trees as symbols to their residence. The Rova at Ambohimanga (Hill 1) with the presence *F. lutea* and *F. polita* creates a space which is sacred or Hasina, with contemporary practices, including those of ancient slaves which are known in Madagascar not to possess land and therefore not having ancestors.

It has been argued, that Andrianampoinimerina used many rituals and symbols rather than direct and aggressive actions as opposed to his son Radama I. Both kings historically contributed to the unification of Madagascar (Raison-Jourde, 1983). It is likely that together with the little poem which spread in all schools, *F. lutea* (Amontana) and *F. polita* (Avi-avi) have also effectively been used to reinforce the power of the kings and have progressively lead other Malagasy kingdoms together with other symbolic practices, to surrender. It has been noted that when starting a speech, the Hova of the Betsileo started with recalling the 12 sacred hills of Antananarivo. The construction of these mythical hills indeed permeated the vision of the whole country as being symbols of power.

4.3. Fecundity and long life

In Antsahadinta (Hill 4), the association between different *Ficus* species, between *Ficus* species and other important forest species (*Dracaena reflexa* and *Brachylaena merana*) with the Queen's history reinforces the power of the royal family through the concept of fecundity and long life. All these attributes are crucial in Malagasy's vision of life where transmission from generation to generation and linkages to ancestors are constantly mobilized to transcend death.

The symbol of fecundity strongly attached to *Ficus* species is a universal characteristic and may have been a common belief independently of the king's activities. However, due to these powerful beliefs, we can see how Andrianampoinimerina used symbols of power and fecundity through presence of *Ficus* species as well as wives, to acquire land and authority.

In Africa, such beliefs have also been clearly established by Dury (1991) and Gautier (1996) for other *Ficus* species. Burrows and Burrows (2003) also point at the importance of *F. lutea* as an important tree that is planted. Its bark was used for making an important traditional cloth, probably important in rituals, while in some places its fruits are eaten. It is however not

possible to link Malagasy beliefs to similar practices and we would rather consider that there is a convergence of uses across different parts of the world rather than uses and beliefs that would have spread from a specific area.

4.4. Land appropriation and relations to ancestors

It is noteworthy that in Madagascar, people belong to the land where their ancestors are buried. Malagasy society is globally divided into three types of people, nobles and kings who are de facto “Hasina”, have super natural powers and act as ancestors for all people and as intermediaries between the people and god, ordinary people whose social existence is linked to the fact that they possess land (Tomponantany) and therefore may have ancestors, and slaves, *andevo*, who have no land and therefore no ancestors (Bloch, 1971, Raison-Jourde, 1983). Planting *Ficus* trees in Madagascar especially *F. lutea* and *F. polita* has been a means of appropriating land and exerting power.

In northern Cameroon, similar practices are shown by Dury (1991) regarding the Fulani, who once dominated the Mandara Mountains tribes, brought *F. polita*, not known to occur naturally in that region, and propagated it solely by cuttings. Quite generally, people in that region transfer many *Ficus* species from one place to another. Most of them are planted using large cuttings near villages or in agricultural lands to feed people and as fodder species, but also for other cultural purposes. The Tupuri and Mousey tribes also living in northern Cameroon, plant large cuttings of *Ficus* species such as *F. glumosa* (Baker) Humbert, *F. platyphylla* Del., *F. thonningii* Blume and *F. ingens* (Miq.) Miq. on the tombs of the tribe's heads (Dury, 1991). Many other *Ficus* species are known to have travelled with people, such as *Ficus sycomorus* L. brought by the ancient Egyptians to Egypt far away from its natural habitat leaving behind its pollinating wasp (Galil, 1968).

The fact that *Ficus* species travel with humans therefore is also a convergent aspect of human–*Ficus* relationships.

5. Conclusion

This study provides some answers and opens new avenues in relation to the following questions:

1) To what extent are *Ficus* species integrated into the ecology of human groups, understood here as interactions between humans (involving social, political and economic dimensions)? Two species, namely *F. lutea* and *F. polita*, are indeed intimately linked to the political history of Madagascar and are among the elements that were mobilized symbolically to unify the country by the Merina. They are intricately linked to humans in rituals that are controlled by strict social hierarchies, relationships of power and different levels of sacredness between people. They thus appear as elements fully belonging to a collective made of human and *Ficus* species linked by strong social bonds.

2) Do humans introduce *Ficus* species into new habitats, potentially offering new ecological opportunities? The paper shows that the distribution of *F. lutea* has been increased by planting by the Merina kings and even today by cultural programs. Although this is not a strict mutualistic relationship, we may conclude that a certain level of mutualism benefits both *F. lutea* and human groups. Humans favor its dispersion and protect the tree where it is planted or dispersed naturally. Depending on local ecological conditions, pollinating wasps and dispersers that may be available, other than humans, *F. lutea* is likely to establish by seedlings without the help of humans although the latter in Madagascar will readily protect such seedlings or simply not dare to cut them.

We may conclude that *F. lutea* and humans are linked in Madagascar on the basis of a mutualism enforced by strong symbols, power relationships between Malagasy social groups,

their history and political context as well as its capacity to live beyond its natural distribution area and to travel with humans.

Contributors

All the authors of this paper participated in each one of the activities including planning, data acquisition, data analysis, manuscript preparation and manuscript revision before submission.

Acknowledgements

We thank all the people that we met and who accepted with great patience to explain all the ethnographic details given in this paper. We also thank specially the care-takers of all the Rova that were visited, the kinfolk of royal families who also accepted to give us detailed accounts of practices relating to *Ficus* species.

We also thank the Sakalava diviner that we met briefly and colleagues from the University of Majunga.

Funding for this project has been obtained by GIP ECOFOR, the SCAC (Cultural Service of the French Embassy) at Madagascar for support provided to Verohanitra Rafidison during her stay in France. We also obtained support from GDRI, CNRS of Madagascar and we thank the CIRAD for providing us free lodging in Antananarivo.

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