Ethnobotanic study around Volcanoes National Park, Rwanda

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Abstract: This study attempts to make a survey through a questionnaire addressed to traditional healers on medicinal plants used in Rwandan traditional medicine around Volcanoes National Park, in the area covering the former sectors of Gataraga, Kinigi and Shingiro, Northern Province, Rwanda. There is also a need to establish the relationship between these plants and those consumed by mountain gorillas in Volcanoes National Park. As results, nine traditional practitioners revealed 77 species grouped in 71 genera and 39 families used in order to treat 19 diseases and symptoms by means of 78 medicinal receipts. Among those species, five are endemic of Albertine Rift and are: *Crassocephalum ducis-aprutii* (Asteraceae), *Pycnostachys goetzenii* (Lamiaceae), *Rumex usambarensis (*Polygonaceae), *Ranunculus bequaertii* (Ranunculaceae) and *Senecio mariettae* (Asteraceae). Being endemic and medicinal at the same time requires a special attention on their exploitation so as to avoid their extinction. Some medicinal plants found in this area are also eaten by mountain gorillas (*Gorilla beringei beringei*) in Volcanoes National Park namely *Clematis simensis* (Ranunculaceae), *Gynura scandens* (Asteraceae), *Plantago palmata* (Plantaginaceae) and *Rumex usambarensis* (Polygonaceae). [New York Science Journal 2010; 3(5): 37-49]. (ISSN: 1554-0200).

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1. Introduction

Besides the domestication and the culture of food plants, all the civilizations of the world developed the therapeutic research on the basis of medicinal plants quality. A plant is known as medicinal, if at least one of its parts contains medicinal properties (Bruneton, 1999). The ethnobotany deals with the relationship between the plants and the humankind, especially those recognized as medicinal by people, their preparation and administration (Bruneton, 1987). A part of the Rwandan population continues to use medicinal plants. The first reason results from the relatively important frequency of the curative effects of this phytotherapy to which the population continues to resort (Desouter, 1991; Van Puyvelde & Dube, 1978). The second results from the inaccessible prices of the current medical products. The traditional practitioners use the various parts of the plant, unequally equipped with active molecules for therapeutic properties. The leaf, the crossroads of all chemical syntheses, is the most used part. The stem is only one corridor of transit between the roots and the leaves but can contain active components, particularly in the bark and sometimes in sapwood. The roots, the rhizomes, the tubers and the bulbs accumulate also therapeutic substances. The flowers, the fruits and the seeds also contain medicinal substances (Delavau et al., 1977). Several factors can influence the chemical composition of a plant. Those may be the place of harvest, the age of the plant, the season and the time during the harvest. Indeed, the place of harvest of a plant (geographical location) affects its active chemical composition. Thus, a plant growing up in a wild state in an area does not have necessarily the same components as the same plant growing up in another area because of different edaphic and climatic conditions (Sofowora, 1996). The age of the plant at the time of harvest is also important and can determine the quantity of each active component (El- said, 1969). Moreover, the active components of a plant can vary in quantity and quality according to the seasons (Trease, 1983). The objective of this study was to highlight, by an interview, the plants used in Rwandan traditional medicine in the area surrounding Volcanoes National Park, particularly in former Kinigi, Gataraga and Shingiro sectors.

2. Material and Methods

Study area

The survey was conducted in three sectors namely Kinigi, Gataraga and Shingiro. This area is located around Volcanoes National Park, in Northern Province of Rwanda, between $1^0$21' and $1^0$35' South latitude and $29^0$22' and $29^0$44'East longitude. The climate is cool and wet; the rainfall can reach the average of 2000mm at 3300m of alttitude but can also fall down up to 900mm at the top of Karisimbi volcano. The annual average temperature is 9^0C. The altitude of this area

dominated by volcanoes varies between 2400m and 4507m.

Sampling method and Data analysis: The purpose of the visit among the traditional healers of the former sectors of Kinigi, Shingiro and Gataraga was to know the medicinal plants used in this area to treat various diseases. For carrying out this ethnobotanic survey, we initially asked for the authorization in the district of Musanze (ex- districts of Kinigi and Mutobo). Then, accompanied by one of the guide of mountain gorillas residing in Bisate area, we visited and questioned traditional doctors about the traditional medicine and plants used. Appendix 1 contains the summary of the questionnaire submitted to the traditional healers of the surveyed area. Microsoft Excel was used for data analysis.

3. Results and discussion

After having carried out the ethnobotanic survey in nine traditional healers' families residing in the ex-districts of Mutobo and Kinigi (current district of Musanze), the results obtained are presented in appendix 1. These results show the diseases treated by these traditional practitioners, the plants used, the mode of preparation and the routes of administration of the drugs. The appendix 2 gives the biological forms and the geographical distribution of the medicinal plants found at the time of the survey. In total, we obtained 77 species grouped in 71 genera and 39 families used in order to treat 19 diseases and symptoms by means of 78 medicinal receipts.

The ten principal families used by the questioned practitioners are Asteraceae (22.47%), Lamiaceae (10.11%), Poaceae and Ranunculaceae (5.06%), Fabaceae (4.49%), Rubiaceae and Chenopodiaceae (3.93%), Urticaceae (3.93%), Chenopodiaceae (3.53%) and Myrtaceae (3.37%). Varied announced species intervene in different receipts. A plant can be used in one or more receipts. We have raised 78 medicinal receipts resulting from 77 species and 39 families. That gives us an average of 1.01 receipts per species. This average varies from a family to another. We noticed that the most significant number of species used in traditional medicine in the surveyed area belongs to the family of Asteraceae (13 species and 40 receipts respectively 30.37% and 22.47%), then Lamiaceae (5 species and 18 receipts respectively 13.67% and 10.11%).

Table1: The most used plants in traditional medicine

Scientific names	Number of receipts	Families	Number of users
1. Sonchus luxurians	7	Asteraceae	7
2. Carduus leptacanthus	6	Asteraceae	6
3. Vernonia auriculifera	6	Asteraceae	5
4. Ranunculus bequaertii	5	Ranunculaceae	5
5. Tetradenia riparia	5	Lamiaceae	5
6. Sinarundinaria alpina	5	Poaceae	3
7. Salvia nilotica	4	Lamiaceae	5
8. Urtica massaica	4	Urticaceae	4
9. Pycnostachys goetzenii	3	Lamiaceae	4

The table 1 contains the first 9 species most used (intervening in several receipts) in human phytotherapy by the population living in the study area. The results show that, the species like *Sonchus luxurians*, *Carduus leptacanthus* and *Vernonia auriculifera* intervene in many medicinal receipts and were announced by several traditional healers.

According to the number of receipts indexed in relation to the most quoted diseases, respiratory disease (cold) occupies the first place (14.1%), followed by wounds (12.8%) then worms (11.54%), pneumonia (11.54%) and the diarrhoea (10.26%).

Relationship between the families of the plants used and the groups of the most treated diseases: A group of families can be specific for one or more groups of diseases. Thus, the diseases of the respiratory system have got many receipts from Asteraceae (18 receipts) followed by Lamiaceae (11 receipts). In second position, come the diseases from the digestive tract with 9 receipts from Asteraceae and 6 receipts from Poaceae. The results show that the families of Lamiaceae and Asteraceae are much more used against the diseases of the respiratory system, digestive and the wounds.

Concerning the routes of administration and modes of preparation: The medicinal plant is either used as one species or in association. The drug can be managed to the patients in the form of crushed, decocted, macerated or infused. The external use is in the form of pomade prepared with the powder of a

crushed plant. Four administration ways were recognized: local application (especially in the form of pomade), nasal way (inhalation), oral way (for the macerated or decocted products), auricular or ocular way (in the form of liquid extract). Concerning the modes of preparation, four techniques were highlighted:The maceration, the decoction, the crushing and the infusion.

Table 2: Medicinal plants found in Volcanoes National Park consumed by mountain gorillas and used by traditional practitioners around the Volcanoes National Park

Scientific names	**Families**	**Parts used by traditional practitioners**	**Parts consumed by mountain gorillas**
Carduus leptacanthus	Asteraceae	L	L, S, R
Clematis simensis	Ranunculaceae	L	L
Crassocephalum ducis-aprutii	Asteraceae	L	L, R
Croton macrostachyus	Euphorbiaceae	L	FR
Cupressus lusitanica	Cupressaceae	L	B
Eucalyptus globulus subsp. maidenii	Myrtaceae	L	B
Gynura scandens	Asteraceae	L	L
Laportea alatipes	Urticaceae	S	L, S
Plantago palmata	Plantaginaceae	R	R
Pycnostachys goetzenii	Lamiaceae	S, L	S
Rubus kirungensis	Rosaceae	FR	FR, L
Rumex abyssinicus	Polygonaceae	L	L, S
Rumex usambarensis	Polygonaceae	R	R
Senecio mannii	Asteraceae	L	M, S
Sinarundinaria alpina	Poaceae	L	L, S
Solanum anguivii	Solanaceae	FR	L, FR
Urera hypselodendron	Urticaceae	L	S, M
Urtica massaica	Urticaceae	L, S	S, R
Vernonia adolfi-fridericii	Asteraceae	L	FR, M, R

Legend: L: Leaves; FR: Fruits; S: Stem; R: Roots; B: Bark; M: Marrow

The results consigned in table 2 show that 19 species of plants grouped in 18 genera and 12 families are both consumed by the mountain gorillas and used in traditional medicine by the traditional healers surrounding the Volcanoes National Park. We note that for certain plants, there is a correspondence between the part used by the traditional healers and that consumed by the mountain gorillas. This case concerns *Clematis simensis* (Ranunculaceae), *Gynura scandens* (Asteraceae), *Plantago palmata* (Plantaginaceae) and *Rumex usambarensis* (Polygonaceae). For other species, there is no correspondence namely *Eucalyptus globulus subsp. maidenii* (Myrtaceae), *Croton macrostachyus* (Euphorbiaceae), *Cupressus lusitanica* (Cupressaceae), *Senecio mannii* and *Vernonia adolfi-fridericii* (Asteraceae), *Solanum anguivii* (Solanaceae) and *Urera hypselodendron* (Urticaceae).

Among 77 medicinal plant species found at the time of this survey, only six belong to the class of Liliopsida with a percentage of 7.7%. They are *Allium sativum* (Alliaceae), *Aloe lateritia* (Aloeaceae), *Elaeis guinensis* (Arecaceae), *Eragrostis racemosa* (Poaceae), *Saccharum officinarum* (Poaceae) and *Sinarundinaria alpina* (Poaceae). Among them, three are edible and cultivated by the traditional healers. They are *Allium sativum*, *Elaeis guinensis* and *Saccharum officinarum.* According to the results of this study, very few plants of the class of Liliopsida are medicinal. The same results were found by Desouter (1991), because, on 360 plants found at the end of the medicinal plants survey used in the human and veterinary pharmacopoeia in Rwanda, only 15 plants belong to the class of Liliopsida (either a percentage of 4.1%). Appendixes 3 and 6 contain detailed information.

Furthermore, amongst the medicinal plants surveyed, 34 have also been mentioned in the study conducted in Gisenyi region by Kayonga et al., 1987 (see appendix 5). The results of the survey also showed

that, among the medicinal plants quoted by the traditional healers, five are endemic of Albertine Rift (Owiunji et al. 2005). These plants are *Crassocephalum ducis-aprutii* (Asteraceae), *Pycnostachys goetzenii* (Lamiaceae), *Rumex usambarensis (*Polygonaceae), *Ranunculus bequaertii* (Ranunculaceae) and *Senecio mariettae* (Asteraceae). As these plant species are at the same time endemic and medicinal, their exploitation requires a special attention in order to avoid their disappearance.

Appendix 1: Medicinal plants used by traditional practitioners interviewed

Diseases treated	Scientific names	Families	Modes of preparation and routes of administration	Parts used
1.Wound	*Sinarundinaria alpina*	Poaceae	To locally apply the crushed fresh leaves	Leaves
	Sinarundinaria alpina + *Salvia nilotica*	Poaceae + Lamiaceae	To locally apply the filtrate of the crushed fresh leaves	Leaves for both
	Carduus leptacanthus+ *Senecio mannii*	Asteraceae+ Asteraceae	To locally apply infused fresh leaves	Leaves for both
	Laportea alatipes	Urticaceae	To locally apply the filtrate of the stems peeled, crushed and heated	Stems
	Hypoestes triflora	Acanthaceae	To locally apply the filtrate of the crushed fresh leaves	Leaves
	Carduus leptacanthus	Asteraceae	To locally apply the filtrate of the crushed fresh leaves	Leaves
	Ficus vallis-choudae	Moraceae	To locally apply the filtrate of the crushed fresh barks	Roots
	Salvia nilotica/+ *Vernonia auriculifera*+ *Desmodium repandum*	Lamiaceae+ Asteraceae+ Fabaceae	To locally apply the filtrate of the crushed fresh leaves	Leaves for three species
	Aloe lateritia+ *Ranunculus bequaertii*+ *Crotalaria cleomifolia*	Aloeaceae+ Ranunculaceae+ Fabaceae	To locally apply the crushed fresh leaves	Leaves
	Dichrocephala integrifolia+ *Amaranthus cruentus*	Asteraceae+ Amaranthaceae	To locally apply the crushed fresh leaves	Leaves
	Pycnostachys goetzenii	Lamiaceae	To orally administer the macerated fresh leaves or the filtrate of the crushed dry stems ; two spoons three times per day (morning, midday, evening) during 5 days	Leaves or Stems
	Crassocephalum ducis-aprutii+ *Plantago palmata*+ *Mitragyna rubrostipulosa*+ *Pycnostachys goetzenii*	Asteraceae+ Plantaginaceae+ Rubiaceae + Lamiaceae	To orally administer the macerated fresh leaves; one spoon three times per day (morning, midday, evening) during 5 days	Leaves for all species
		Solanaceae	To orally administer the filtrate of fresh fruits; one spoon three times per day (morning, midday, evening) during 5 days	Fruits
	Lantana trifolia	Verbenaceae	To orally administer the filtrate of fresh leaves; two spoons three times per day (morning, midday, evening) during 5 days	Leaves
	Cinchona ledgeriana	Rubiaceae	To orally administer the filtrate of crushed bark or leaves; one spoon three times per day (morning, midday, evening) during 5 days	Bark or Leaves
	Rubus kirungensis+ *Tetradenia riparia*+ *Desmodium repandum*	Rosaceae+ Lamiaceae+ Fabaceae	To orally administer the filtrate of fresh leaves; one spoon three times per day (morning, midday, evening) during 5 days	Leaves
3. Pneumonia	*Bidens pilosa*	Asteraceae	To orally administer the filtrate of fresh leaves; one spoon three times per day (morning, midday, evening) during 5 days	Leaves

	Bidens pilosa+ *Cynodon nlemfuensis*+ *Dichrocephala integrifolia*+ *Physalis peruviana*	Asteraceae+ Poaceae + Asteraceae + Solanaceae	To orally administer the filtrate of crushed fresh leaves; one spoon three times per day (morning, midday, evening) during 5 days	Leaves for all species
	Chenopodium ugandae+ *Leonotis nepetaefolia*+ *Gynandropsis gynandra*	Chenopodiaceae+ Lamiaceae+ Capparidaceae	To orally administer the filtrate of fresh leaves; one spoon three times per day (morning, midday, evening) during 5 days	Leaves
	Eucalyptus globulus subsp. maidenii+ *Allium sativum*	Myrtaceae+ Alliaceae	To orally administer the filtrate of fresh roots and leaves; one spoon three times per day (morning, midday, evening) during 5 days	Leaves Roots
	Vernonia adolfi-fridericii+ *Leonotis nepetaefolia*	Asteraceae+ Lamiaceae	To orally administer the filtrate of fresh leaves; two spoons three times per day (morning, midday, evening) during 5 days	Leaves
	Solanum terminale+ *Leonotis nepetaefolia*	Solanaceae+ Lamiaceae	To orally administer the filtrate of crushed fresh leaves; two spoons three times per day (morning, midday, evening) during 5 days	Leaves for both species
	Carduus leptacanthus+ *Maesa lanceolata*+ *Clerodendrum fuscum*+ *Dichrocephala integrifolia*+ *Aloe lateritia*	Asteraceae+ Myrsinaceae+ Verbenaceae+ Asteraceae+ Aloeaceae	To orally administer the filtrate of dry and crushed leaves; two spoons three times per day (morning, midday, evening) during 5 days	Leaves for all species
	Myrica mildbraedii+ *Markhamia lutea*	Myricaceae+ Bignoniaceae	To administer by nasal way the crushed dry barks; two spoons three times per day (morning, midday, evening) during 5 days	Bark
	Carduus leptacanthus	Asteraceae	To orally administer the filtrate of dry and crushed leaves; two spoons three times per day (morning, midday, evening) during 5 days	Leaves
4. Diarrhoea	*Plantago palmata*+ *Rubia cordifolia*+ *Chenopodium procerum*+ *Eragrostis racemosa*	Plantaginaceae+ Rubiaceae+ Chenopodiaceae + Poaceae	To orally administer the filtrate of fresh and crushed leaves and roots; two spoons three times per day (morning, midday, evening) during 5 days	Roots Roots Leaves Leaves
	Plectranthus laxiflorus	Lamiaceae	To orally administer the filtrate of fresh leaves; one spoon three times per day (morning, midday, evening) during 5 days	Leaves
	Sinarundinaria alpina+ *Pycnostachys goetzenii*+ *Dombeya goetzenii*+ *Urera hypselodendron*+ *Cupressus lusitanica*	Poaceae+ Lamiaceae+ Sterculiaceae+ Urticaceae + Cupressaceae	To orally administer the filtrate of fresh leaves and crushed stems; two spoons three times per day (morning, midday, evening) during 5 days	Leaves Leaves or Stems Leaves Leaves Leaves
	Urtica massaica	Urticaceae	To orally administer the macerated fresh leaves or the filtrate of dry and crushed stems; two spoons three times per day (morning, midday, evening) during 5 days	Leaves or Stems
	Kalanchoe integra+ *Carica papaya*	Crassulaceae+ Caricaceae	To orally administer the filtrate of fresh and crushed seeds; one spoon three times per day (morning, midday, evening) during 5 days	Leaves Seeds
	Chenopodium procerum+ *Momordica foetida*	Chenopodiaceae+ Cucurbitaceae	To orally administer the filtrate of fresh leaves; one spoon three times per day (morning, midday, evening) during 5 days	Leaves for both
	Chenopodium ugandae+ *Chenopodium procerum*	Chenopodiaceae	To orally administer the filtrate of fresh and crushed leaves; two spoons three times per day (morning, midday, evening) during 5 days	Leaves
	Eucalyptus globulus subsp. maidenii+ *Erythrina abyssinica*+ *Carica papaya*+ *Passiflora edulis*	Myrtaceae+ Fabaceae+ Caricaceae+ Passifloraceae	To orally administer the filtrate of fresh and crushed leaves, barks and seeds; two spoons three times per day (morning, midday, evening) during 5 days	Bark Leaves Seeds Leaves
5. Worms	*Sinarundinaria alpina*+ *Cupressus lusitanica*	Poaceae+ Cupressaceae	To orally administer the filtrate of fresh and crushed leaves; two spoons three times per day (morning, midday, evening) during 5 days	Leaves for both
	Tithonia diversifolia+ *Allium sativum*	Asteraceae+ Alliaceae	To orally administer the filtrate of leaves and dry and crushed roots; one spoon three times per day (morning, midday, evening) during 5 days	Leaves Roots

	Datura stramonium	Solanaceae	To orally administer the filtrate of fresh and crushed leaves; one spoon three times per day (morning, midday, evening) during 5 days	Leaves
	Vernonia adolfi-fridericii+ *Vernonia auriculifera* + *Croton macrostachyus* + *Salvia nilotica*	Asteraceae+ Asteraceae+ Euphorbiaceae + Lamiaceae	To orally administer the filtrate of fresh and crushed leaves; one spoon three times per day (morning, midday, evening) during 5 days	Leaves for all species
	Vernonia auriculifera+ *Allium sativum*	Asteraceae+ Alliaceae	To orally administer the filtrate of leaves and fresh and crushed roots; one spoon three times per day (morning, midday, evening) during 5 days	Roots Leaves
	Zehneria scabra	Cucurbitaceae	To orally administer the filtrate of fresh and crushed leaves; one spoon three times per day (morning, midday, evening) during 5 days	Leaves
	Allium sativum	Alliaceae	To orally administer the filtrate of fresh and crushed roots; one spoon three times per day (morning, midday, evening) during 5 days	Roots
	Chenopodium ugandae+ *Chenopodium procerum*+ *Momordica foetida*	Chenopodiaceae + Cucurbitaceae	To orally administer the filtrate of fresh and crushed leaves; one spoon three times per day (morning, midday, evening) during 5 days	Leaves for all species
	Myrica mildbraedii+ *Olea hochstetteri*+ *Elaeis guinensis*+ *Croton macrostachyus*	Myricaceae + Oleaceae+ Arecaceae+ Euphorbiaceae	To orally administer the filtrate of dry and crushed barks; one spoon three times per day (morning, midday, evening) during 5 days	Barks for each species
6. Cold	*Ranunculus bequaertii*+ *Tetradenia riparia*	Ranunculaceae+ Lamiaceae	To nasally administer th powder of dry and crushed leaves	Leaves
	Vernonia auriculifera+ *Sonchus luxurians*	Asteraceae+ Asteraceae	To orally administer the filtrate of leaves and fresh and crushed plants; one spoon three times per day (morning, midday, evening) during 5 days	Leaves Whole plant
	Ranunculus bequaertii+ *Bidens pilosa*+ *Sonchus luxurians*	Ranunculaceae+ Asteraceae+ Asteraceae	To orally administer the filtrate of leaves and fresh and crushed plants; one spoon three times per day (morning, midday, evening) during 5 days	Leaves Leaves Whole plant
	Ranunculus bequaertii+ *Vernonia auriculifera*+ *Sonchus luxurians*	Ranunculaceae+ Asteraceae+ Asteraceae	To orally administer the filtrate of leaves and fresh and crushed plants; one spoon three times per day (morning, midday, evening) during 5 days	Leaves Leaves Whole plant
	Geranium arabicum+ *Sonchus luxurians*	Geraniaceae+ Asteraceae	To orally administer the filtrate of leaves and fresh and crushed plants; one spoon three times per day (morning, midday, evening) during 5 days	Leaves Whole plant
	Ranunculus bequaertii+ *Sonchus luxurians*+ *Erythrina abyssinica*	Ranunculaceae+ Asteraceae+ Fabaceae	To orally administer the filtrate of leaves, flowers and fresh and crushed plants; one spoon three times per day (morning, midday, evening) during 5 days	Leaves Whole plant Flowers
	Vernonia amygdalina+ *Salvia nilotica*+ *Markhamia lutea*	Asteraceae+ Lamiaceae+ Bignoniaceae	To administer the filtrate of fresh and crushed leaves and flowers; one spoon three times per day (morning, midday, evening) during 5 days	Leaves Leaves Flowers
	Lantana trifolia+ *Sesanum angustifolium*	Verbenaceae+ Pedaliaceae	To orally administer the filtrate of fresh and crushed leaves; one spoon three times per day (morning, midday, evening) during 5 days	Leaves for both
	Eucalyptus globulus subsp. maidenii+ *Tetradenia riparia*	Myrtaceae+ Lamiaceae	Boiling the leaves into water, curving the head covered by a blanket and inhaling the vapors.	Leaves for both
	Rubia cordifolia	Rubiaceae	To orally administer the filtrate of fresh and crushed roots; one spoon three times per day (morning, midday, evening) during 5 days	Roots
	Plectranthus laxiflorus+ *Cupressus lusitanica*+ *Eucalyptus globulus subsp. maidenii*+ *Chenopodium procerum*+ *Tetradenia riparia*	Lamiaceae + Cupressaceae + Myrtaceae + Chenopodiaceae + Lamiaceae	Boiling the leaves into water, curving the head covered by a blanket and inhaling the vapors.	Leaves for all species
7. Sore throat	*Clematis simensis*	Ranunculaceae	To orally administer the filtrate of fresh leaves; one spoon three times per day (morning, midday, evening) during 5 days	Leaves
	Bidens pilosa+ *Sonchus luxurians*+ *Erythrina abyssinica*	Asteraceae+ Asteraceae+ Fabaceae	To orally administer the filtrate of the fresh and crushed fruits and leaves; one spoon three times per day (morning, midday, evening) during 5 days	Fruits All parts Leaves
8. Stomachache	*Urtica massaica*	Urticaceae		Leaves
	Vernonia auriculifera	Asteraceae	To orally administer the filtrate of fresh leaves; one spoon three times per day (morning, midday, evening) during 5 days	Leaves for all species

	Urtica massaica+ *Carduus leptacanthus*	Urticaceae+ Asteraceae	To orally administer the filtrate of fresh leaves; one spoon three times per day (morning, midday, evening) during 5 days	
	Maesa lanceolata+ *Elaeis guinensis*+ *Eragrostis racemosa*	Myrsinaceae+ Arecaceae+ Poaceae	To orally administer the filtrate of fresh leaves; one spoon three times per day (morning, midday, evening) during 5 days	Leaves for three species
	Maesa lanceolata+ *Elaeis guinensis*+ *Rubia cordifolia*	Myrsinaceae+ Arecaceae+ Rubiaceae	To orally administer the filtrate of fresh and crushed leaves. one spoon three times per day (morning, midday, evening) during 5 days	Leaves Leaves All parts
9. Liver disease	*Gynura scandens*	Asteraceae	To orally administer the filtrate of fresh and crushed leaves ;one spoon three times per day (morning, midday, evening) during 5 days	Leaves
	Hypoestes triflora+ *Aloe lateritia*+ *Saccharum officinarum*	Acanthaceae+ Aloeaceae+ Poaceae	To orally administer the filtrate of the crushed fresh leaves and stems; one spoon three times per day (morning, midday, evening) during 5 days	Leaves Leaves Stems
	Erythrina abyssinica	Fabaceae	To orally administer the filtrate of fresh and crushed leaves; one spoon three times per day (morning, midday, evening) during 5 days	Leaves
	Sinarundinaria alpina+ *Triumfetta cordifolia*+ *Elaeis guinensis* + *Persea Americana*	Poaceae+ Tiliaceae+ Arecaceae+ Lauracaee	To orally administer the filtrate of fresh leaves and ground fruits; one spoon three times per day (morning, midday, evening) during 5 days	Leaves Leaves Leaves Fruits
10. Kidneys	*Urtica massaica*+ *Ranunculus stagnalis*+ *Rumex abyssinicus*+ *Rubia cordifolia*+ *Ficus vallis-choudae* + *Chenopodium ugandae*	Urticaceae+ Ranunculaceae+ Polygonaceae+ Rubiaceae+ Moraceae+ Chenopodiaceae	To orally administer the macerated leaves and roots of fresh plants; two spoons three times per day (morning, midday, evening) during 5 days	Roots Leaves Leaves All parts Leaves Leaves
	Urtica massaica+ *Ricinus communis*	Urticaceae+ Euphorbiaceae	To orally administer the filtrate of the crushed and fresh sheets; one spoon three times per day (morning, midday, evening) during 5 days	Leaves Fruits
11. Scale	*Acanthus pubescens*+ *Lindernia subracemosa*	Acanthaceae+ Scrophulariaceae	To roast the sheets and get the ash to apply to the skin	Leaves
	Sesanum angustifolium	Pedaliaceae	To locally apply the filtrate of the crushed sheets	Leaves
12. Eyes diseases	*Carduus leptacanthus*	Asteraceae+	To administer by ocular way the filtrate of the crushed and fresh sheets	Leaves for three species
	Plantago palmata+ *Sonchus luxurians*	Plantaginaceae+ Asteraceae	To administer by ocular way the filtrate of the crushed and fresh sheets	Leaves
13.Teeth diseases	*Dissotis senegambiensis*	Melastomataceae	Everyday, chewing washed sheets	Leaves
14. Hemorrhoids	*Senecio mannii*+ *Salvia nilotica*	Asteraceae + Lamiaceae	To orally administer the filtrate of the crushed and fresh sheets; one spoon three times per day (morning, midday, evening) during 5 days	Leaves for both
15. Paludism	*Plectranthus laxiflorus*+ *Tetradenia riparia*+ *Sesanum angustifolium*	Lamiaceae+ Lamiaceae+ Pedaliaceae	To orally administer the filtrate of the crushed and fresh sheets; one spoon three times per day (morning, midday, evening) during 5 days	Leaves for both
	Psidium guajava+ *Persea americana*	Myrtaceae+ Lauraceae	To orally administer the filtrate of the crushed and fresh sheets; one spoon three times per day (morning, midday, evening) during 5 days	Leaves for both
16. Rheumatism	*Clematis simensis*+ *Desmodium repandum*+ *Maesa lanceolata*+ *Kalanchoe integra*+ *Mitragyna subrostipulosa*	Ranunculaceae+ Fabaceae+ Myrsinaceae+ Crassulaceae+ Rubiaceae	To orally administer the filtrate of the crushed and fresh sheets; one spoon three times per day (morning, midday, evening) during 5 days	Leaves for all plants
17. Whooping-cough	*Plantago palmata* + *Crassocephalum vitellinum* + *Vernonia auriculifera*+ *Physalis peruviana*	Plantaginaceae+ Asteraceae+ Asteraceae+ Solanaceae	To orally administer the filtrate of the crushed and fresh sheets; one spoon three times per day (morning, midday, evening) during 5 days	Leaves Flowers Leaves Leaves
18. Asthma	*Gomphocarpus physocarpus*	Asclepiadaceae	To orally administer the filtrate of the crushed and fresh sheets; two spoons three times per day (morning, midday, evening) during 5 days	Leaves
19. Otitis	*Rumex usambarensis*+ *Cyathula polycephala*+ *Phaseolus vulgaris*	Polygonaceae+ Amaranthaceae + Fabaceae	To administer by auricular way the macerated fresh sheets and roots	Roots Leaves

Appendix 2: Scientific names, biological forms and geographic distribution *of medicinal plants used*

Scientific names	Families	Biological forms	Geographic distribution
1. Sinarundinaria alpina SCHUMANN	Poaceae	Phanerophytes	Intertropical Africa Mountains
2. Salvia nilotica JUSS. ex JACQ.	Lamiaceae	Hemycryptophytes	Intertropical and Oriental Africa.
3. Carduus leptacanthus FRESEN.	Asteraceae	Therophytes	Intertropical and Oriental Africa
4. Senecio mannii HOOK. f.	Asteraceae	Phanerophytes	Intertropical Africa
5. Laportea alatipes HOOK. f.	Urticaceae	Phanerophytes	Intertropical Africa mountains
6. Hypoestes triflora (FORSSKAL) ROEMER et SCHULTES	Acanthaceae	Phanerophytes	Intertropical Africa
7. Ficus vallis-choudae DELILE	Moraceae	Phanerophytes	Intertropical Africa
8. Desmodium repandum (VAHL) DC.	Fabaceae	Chamaephytes	Paleotropical
9. Aloe lateritia ENGLER	Aloeaceae	Phanerophytes	Intertropical and Oriental Africa
10. Ranunculus bequaertii DE WILD.	Ranunculaceae	Hemycryptophytes	Intertropical Africa
11. Crotalaria cleomifolia WELW. ex BAKER	Fabaceae	Chamaephytes	Intertropical Africa
12. Dichrocephala integrifolia (L. F.) KUNTZE	Asteraceae	Therophytes	Paleotropical
13. Amaranthus cruentus L.	Amaranthaceae	Phanerophytes	Subcosmopolitan
14. Pycnostachys goetzenii GUERKE	Lamiaceae	Phanerophytes	Intertropical, Central and Oriental Africa mountains
15. Crassocepha-lum ducis-aprutii (CHIOV.) S. MOORE	Asteraceae	Phanerophytes	Intertropical Africa mountains
16. Plantago palmata HOOK. f.	Plantaginaceae	Hemycryptophytes	Intertropical Africa mountains
17. Mitragyna rubrostipulosa (SCHUMANN) HAVIL	Rubiaceae	Phanerophytes	Intertropical and Oriental Africa
18. Solanum anguivii LAM. S. L.	Solanaceae	Phanerophytes	Pantropical
19. Lantana trifolia L.	Verbenaceae	Phanerophytes	Intertropical Africa
20. Cinchona ledgeriana MOENS	Rubiaceae	Phanerophytes	Intertropical Africa
21. Rubus kirungensis ENGL.	Rosaceae	Phanerophytes	Intertropical Africa mountains
22. Tetradenia riparia (HOCHST.) CODD.	Lamiaceae	Phanerophytes	Intertropical and Oriental Africa
23. Bidens pilosa L.	Asteraceae	Therophytes	Subcosmopolitan
24. Cynodon nlemfuensis VANDERYST	Poaceae	Chamaephytes	Intertropical Africa
25. Physalis peruviana L.	Solanaceae	Phanerophytes	Intertropical Region
26. Chenopodium ugandae (AELLEN) AELLEN	Chenopodiaceae	Chamaephytes	Intertropical. Oriental Africa
27. Leonotis nepetaefolia (R.BR.) AITON. f.	Lamiaceae	Therophytes	Pantropical
28. Gynandropsis gynandra (L.) BRIQ.	Capparidaceae	Hemycryptophytes	Pantropical
29. Eucalyptus globulus subsp. *maidenii* (F. J. MUELL. KIRKP	Myrtaceae	Phanerophytes	Pantropical

30. Allium sativum L.	Alliaceae	Geophytes	Subcosmopolitan
31. Vernonia adolfi fridericii MUSCHLER	Asteraceae	Phanerophytes	Intertropical and Subtropical Region
32. Solanum terminale FORSSKAL	Solanaceae	Phanerophytes	Central and Oriental Region
33. Maesa lanceolata FORSSKAL	Myrsinaceae	Phanerophytes	Intertropical Region
34. Clerodendrum fuscum GUERKE	Verbenaceae	Phanerophytes	Intertropical Region
35. Markhamia lutea (BENTH.) SCHUM	Bignoniaceae	Phanerophytes	Intertropical Region
36. Myrica mildbraedii ENGL.	Myricaceae	Phanerophytes	Intertropical and Oriental Region
37. Rubia cordifolia AUCT.	Rubiaceae	Chamaephytes	Intertropical Africa
38. Chenopodium procerum HOCHST . ex MOQ.	Chenopodiaceae	Chamaephytes	Intertropical and Oriental Africa
39. Eragrostis racemosa (THUNB.) STEUDEL	Poaceae	Therophytes	Intertropical and Oriental Africa
40. Plectranthus laxiflorus BENTH.	Lamiaceae	Chamaephytes	Intertropical and Oriental Africa
41. Dombeya goetzenii SCHUMANN	Sterculiaceae	Phanerophytes	Intertropical Africa
*42. Urera hypselodendron (*HOCHST.ex A.RICH) WEDD	Urticaceae	Phanerophytes	Pantropical
43. Cupressus lusitanica MILL	Cupressaceae	Phanerophytes	Pantropical
44. Urtica massaica MILDBR.	Urticaceae	Phanerophytes	Intertropical and Oriental Africa
45. Kalanchoe integra (MED.) O. KUNTZE	Crassulaceae	Chamaephytes	Intertropical Africa
46. Carica papaya L.	Caricaceae	Phanerophytes	Intertropical Africa and America
47. Erythrina abyssinica LAM. ex DC	Fabaceae	Phanerophytes	Inter and Subtropical Region
48. Passiflora edulis SIMS	Passifloraceae	Phanerophytes	Intertropical Africa, America, Asia and Australia.
*49. Tithonia diversifolia (*HEMSLEY) A. GRAY	Asteraceae	Phanerophytes	Inter and Subtropical Africa
50. Datura stramonium L.	Solanaceae	Phanerophytes	Subcosmopolitan
51. Vernonia auriculifera HIERN	Asteraceae	Phanerophytes	Intertropical Central and Oriental Africa
52. Croton macrostachyus HOCHST. ex DELILE	Euphorbiaceae	Phanerophytes	Intertropical Africa
53. Zehneria scabra (L.F.) SONDER	Cucurbitaceae	Hemycryptophytes	Intertropical Africa, Asia, Australia and Polynesia
54. Momordica foetida SCHUM	Cucurbitaceae	Hemycryptophytes	Intertropical and South Africa
55. Olea hochstetteri BAKER	Oleaceae	Phanerophytes	Intertropical Africa
56. Elaeis guinensis JACQ.	Arecaceae	Phanerophytes	Intertropical Africa
57. Sonchus luxurians (R. E. FRIES) C. JEFFREY	Asteraceae	Chamaephytes	Intertropical Africa
58. Geranium arabicum FORSSKAL	Geraniaceae	Chamaephytes.	Intertropical Africa Mountains
59. Vernonia amygdalina DELILE	Asteraceae	Phanerophytes	Intertropical Africa
60. Senanum angustifolium (OLIVER) ENGL.	Pedaliaceae	Phanerophytes	Intertropical Africa
61. Clematis simensis FRES.	Ranunculaceae	Phanerophytes	Intertropical Africa
62. Gynura scandens O.HOFFM.	Asteraceae	Phanerophytes	Intertropical and Oriental Africa
63. Saccharum officinarum L.	Poaceae	Phanerophytes	Intertropical region

64. Triumfetta cordifolia A. RICH	Tiliaceae	Phanerophytes	Intertropical region
65. Persea americana MILL.	Lauraceae	Phanerophytes	Intertropical region
66. Ranunculus stagnalis HOCHST ex A. RICH	Ranunculaceae	Hemicryptophytes	Intertropical and Oriental Africa
67. Rumex abyssinicus JACQ.	Polygonaceae	Hemicryptophytes	Intertropical and Oriental Africa
68. Ricinus communis L.	Euphorbiaceae	Phanerophytes	Intertropical Africa

Appendix 3: Medicinal Plants surveyed by Dessouter (1991) belonging to the class of Liliopsida

Scientific names	**Families**	**Medicinal usage / Parts used**
1. Aloe lateritia	Aloeaceae	Laxative, purgative, constipation/ Leaves
2. Elaeis guinensis	Arecaceae	Stimulant of appetite/ Stems
3. Phoenix reclinata	Arecaceae	Appetizer/ Leaves, Stems
4. Commelina ancilema	Commelinaceae	Vomitory, burn, eyes / Leaves and Stems
5. Commelina benghalensis	Commelinaceae	Diarrhoea/ Leaves and Stems
6. Commelina cyanotis	Commelinaceae	
7. Canna generalis	Cannaceae	Vomitory, burn, eyes/Leaves and Stems
8. Cynodon dactylon	Poaceae	Against worms/ Leaves
9. Cyperus papyrus	Cyperaceae	Salt/ Stems
10. Dracaena afromontana	Dracaenaceae	Antidiarrhoea/ Leaves
11. Dracaena papahu	Dracaenaceae	Syphilis/ Leaves
12. Dracaena steudneri	Dracaenaceae	
13. Ensete ventricosum	Musaceae	Dermatosis/ Rhizome
14. Eulophia sp.	Orchidaceae	Wounds/ Roots
15. Gladiolus psittacinus	Liliaceae	Hematuria, madness/ Tubers

Appendix 4: List of plants consumed by mountain gorillas in Volcanoes National Park

Scientific names	**Families**	**Parts consumed**
1. Ardisia kivuensis TATON	Myrsinaceae	Marrow
2. Basella alba L.	Basellaceae	Flowers
3. Carduus kikuyorum R. E. FRIES	Asteraceae	Roots,stems, leaves
4. Carduus leptacanthus FRESEN.	Asteraceae	Roots, stems, leaves
5. Carduus nyassanus (S. MOORE) R. E. FRIES	Asteraceae	Roots, leaves
6. Carex bequaertii DE WILD.	Cyperaceae	Leaves, flowers
7. Cineraria deltoidea SONDER	Asteraceae	Leaves
8. Clematis simensis FRESEN.	Ranunculaceae	Leaves
9. Crassocephalum ducis-aprutii (CHIOV.) S. MOORE	Asteraceae	Leaves, roots
10. Croton megalocarpus HUTCH	Euphorbiaceae	Fruit
11. Cupressus lusitanica (MILL)	Cupressaceae	Bark
12. Cynoglossum lanceolatum FORSSKAL	Boraginaceae	Roots
13. Discopodium penninervium HOCHST	Solanaceae	Fruits, marrow
14.Dombeya goetzenii SCHUMANN	Sterculiaceae	Flowers
15. Dracaena L. *sp.*	Dracaenaceae	Fruits
16. Droguetia iners (FORSK.) SCHWEINF.	Urticaceae	Stems, Leaves
17. Englerina woodfordioides (SCHWEINF.) BALLE	Loranthaceae	Leaves
18. Eucalyptus globulus subsp. maidenii (F.J. MUELL.) KIRKP.	Myrtaceae	Bark
19. Festuca engleri PILGER	Poaceae	Leaves
20. Galium chloroionanthum SCHUMANN	Rubiaceae	All parts
21. Galium ruwenzoriense (CORTESI) CHIOV.	Rubiaceae	Leaves, stems
22.Geranium arabicum FORSSKAL	Geraniaceae	Leaves
23. Girardinia bullosa (HOCHST. ex STEUD)	Urticaceae	Roots
24. Gynura scandens O. HOFFM.	Asteraceae	Leaves
25. Hydrocotyle mannii HOOK. f.	Apiaceae	Leaves
26. Hypericum lanceolatum LAM.	Hypericaceae	Leaves

28. Hypericum peplidifolium A. RICH	Hypericaceae	Leaves
29. Hypericum revolutum VAHL	Hypericaceae	Bark
30. Impatiens burtonii HOOK. f.	Balsaminaceae	Fruits
31. Kotschya aeschynomenoides (BAKER) DEWIT et DUVIGN.	Fabaceae	Fruits
32. Lactuca attenuata STEBBINS	Asteraceae	Leaves
33. Lagenaria sp. SERINGE	Cucurbitaceae	Fruits
34. Laportea alatipes HOOK. f.	Urticaceae	Stems, leaves
35. Leucas deflexa HOOK. f.	Lamiaceae	Leaves, roots
36. Lobelia giberroa HEMSLEY	Lobeliaceae	Roots, marrow
37. Lobelia stuhlmanii SCHWEINF. ex STUHLMANN	Lobeliaceae	Marrow, roots
38. Lobelia wollastonii BAKER. f.	Lobeliaceae	Marrow, roots
39. Mikania cordata (BURM. f.) B. L. ROBINSON	Asteraceae	Stems
40. Mimulopsis arborescens C. B. CLARKE	Acanthaceae	Roots
41. Mimulopsis excellens LINDAU	Acanthaceae	Roots
42. Peucedanum kerstenii ENGL.	Apiaceae	Roots, Stems
43. Peucedanum linderi NORMAN	Apiaceae	Roots, Stems, Marrow
44. Pilea rivularis WEDD.	Urticaceae	Leaves
45. Plantago palmata HOOK. f.	Plantaginaceae	Roots
46. Prenanthes subpeltata STEBBINS	Asteraceae	Leaves
47. Prunus africana (HOOK. f.) KALKMAN	Amygdalaceae	Roots, Bark
48. Pycnostachys goetzenii GUERKE	Lamiaceae	Marrow, young stems
49. Pyschotria mahonii C. H. WRIGHT	Rubiaceae	Roots
50. Rubus runssorensis ENGL.	Rosaceae	Fruits, leaves
50. Rumex abyssinicus JACQ.	Polygonaceae	Stems, leaves
*51. Rumex usambarensis (*ENGL.) DAMMER	Polygonaceae	Stems, leaves
52. Senecio mannii HOOK.f.	Asteraceae	Marrow, sap
53. Senecio mariettae MUSCHLER	Asteraceae	Leaves
54. Senecio subsessilis OLIVER et HIERN	Asteraceae	Roots
55. Sinarundinaria alpina SCHUMANN	Poaceae	Leaves, young trees
56. Solanum anguivii LAM.	Solanaceae	Fruits, Leaves
57. Solanum nigrum L.	Solanaceae	Fruits
58. Stachys aculeolata HOOK. f.	Lamiaceae	Leaves
58. Stellaria sennii CHIOV.	Caryophyllaceae	Leaves
59. Tenaris rubella E. MEYER	Asclepiadaceae	All parts
60. Tylophoropsis heterophylla N. E. BR.	Asclepiadaceae	Leaves
61. Urera cameroonensis WEDD.	Urticaceae	Stems, Leaves
63. Urera hypselodendron HOCHST. Ex A. RICH	Urticaceae	Stems, marrow
64. Urtica massaica MILDBR.	Urticaceae	Roots, stems
65. Vernonia adolfi-fridericii MUSCHLER	Asteraceae	Roots, stems, sap, marrow

Sources: McNeilage (1995), (Plumptre, 1991), (Vedder, 1989), (Watts, 1983) and (Weber, 1981).

Appendix 5: List of medicinal plants surveyed and mentioned by Kayonga* et al.*, (1987).

Scientific names	**Families**	**Diseases treated/ Parts used**
1. Leonotis nepetaefolia	Lamiaceae	Pneumonia/ Leaves
2. Chenopodium ugandae	Chenopodiaceae	
3. Clematis simensis	Ranunculaceae	
4. Bidens pilosa	Asteraceae	
5. Physalis peruviana	Solanaceae	
6. Lantana trifolia	Verbenaceae	
7. Eucalyptus globulus subsp. maidenii	Myrtaceae	Cough/ Leaves
8. Kalanchoe integra	Crassulaceae	
9. Rumex abyssinicus	Polygonaceae	
10. Erythrina abyssinica	Fabaceae	Asthma/ Leaves
11. Mitragyna rubrostipulosa	Rubiaceae	
12. Psidium guajava	Myrtaceae	Whooping-cough/ Leaves
13. Maesa lanceolata	Myrsinaceae	
14. Chenopodium procerum	Chenopodiaceae	Stomach/ Leaves
15. Gynandropsis gynandra	Capparidaceae	Worms/ Leaves
16. Ranunculus stagnalis	Ranunculaceae	Worms/Leaves
17. Desmodium repandum	Fabaceae	Anorexia/ Leaves
18. Crassocephalum vitellinum	Asteraceae	Anorexia/ Leaves

19. Urtica massaica	Urticaceae	Diarrhoea/ Stems, Leaves
20. Plantago palmata	Plantaginaceae	Stomach/ Leaves, Roots
21. Gynura scandens	Asteraceae	Stomach/ Leaves
22. Vernonia amygdalina	Asteraceae	Worms/ Leaves
23. Hypoestes triflora	Acanthaceae	Kidneys/ Leaves
24. Acanthus pubescens	Acanthaceae	Stomach/ Leaves
25. Triumfetta cordifolia	Tiliaceae	Stomach/ Leaves
26. Tithonia diversifolia	Asteraceae	Worms/ Leaves, Flowers
27. Allium sativum	Alliaceae	Worms/ Bulb
28. Vernonia auriculifera	Asteraceae	Worms/ Leaves
29. Salvia nilotica	Lamiaceae	
30. Rubia cordifolia	Rubiaceae	
31. Ricinus communis	Euphorbiaceae	Worms/ Fruits
32. Dichrocephala integrifolia	Asteraceae	Worms/ Leaves
33. Gomphocarpus physocarpus	Asclepiadaceae	Worms/ Fruits
34. Datura stramonium	Solanaceae	Worms/ Leaves, Fruits

Appendix 6: List of medicinal plants surveyed and mentioned by Desouter (1991)

Scientific names	**Families**	**Medicinal utility/ Parts used**
1. Urtica massaica	Urticaceae	antidiarrheic, Stomachache/ Leaves and stems
2. Solanum nigrum	Solanaceae	Worms/ Leaves
3. Gynandropsis gynandra	Capparida-ceae	Worms/ Leaves, Flowers
4. Elaeis guinensis	Arecaceae	Stimulant of appetite
5. Vernonia amygdalina	Asteraceae	Antipyretic, antipaludic/ Leaves
6. Gynura scandens	Asteraceae	
7. Tetradenia riparia	Lamiaceae	Headache/ Leaves
8. Leonotis nepetaefolia	Lamiaceae	Stomachache/ Leaves
9. Ricinus communis	Euphor-biaceae	Constipation, laxative, purgative/ Fruits
10. Rumex abyssinicus	Polygonaceae	Constipation, laxative, purgative/ Roots, Stems
11. Aloe lateritia	Aloeaceae	Constipation, laxative, purgative / Leaves
12. Zehneria scabra	Cucurbita-ceae	Constipation, laxative, purgative / Leaves
13. Clerodendrum fuscum	Verbenaceae	Diarrhoea/ Leaves
14. Mitragyna rubrostipulosa	Rubiaceae	
15. Eucalyptus globulus subsp. maidenii	Myrtaceae	Cold of brain/ Leaves
16. Triumfetta cordifolia	Tiliaceae	Pneumonia, bronchitis/ Leaves
17. Momordica foetida	Cucurbita-ceae	Cough/ Leaves
18. Lantana trifolia	Verbenaceae	
19. Datura stramonium	Solanaceae	
20. Erythrina abyssinica	Fabaceae	
21. Kalanchoe integra	Crassulaceae	Wound/ Leaves
22. Rubia cordifolia	Rubiaceae	Ulcerate, wound/ Leaves
23. Sesanum angustifolium	Pedaliaceae	Scale/ Leaves
24. Chenopodium procerum	Chenopodia-ceae	Leprosy/ Leaves
25. Clematis simensis	Ranuncula-ceae	Pian/ Leaves
26. Gomphocarpus physocarpus	Asclepiada-ceae	Heart disease/ Fruits
27. Rumex usambarensis	Polygonaceae	Angina, diphteria, laryngitis/ Leaves
28. Senecio mariettae	Asteraceae	Pian/ Leaves
29. Maesa lanceolata	Myrsinaceae	Muscles, wrenches/ Leaves
30. Crassocephalum vitellinum	Asteraceae	Antenatal care/ Leaves
31. Olea hochstetteri	Oleaceae	Cooking oil/ Fruits

69. Acanthus pubescens (THOMSON ex OLIVER) ENGL.	Acanthaceae	Phanerophytes	Intertropical Central and Oriental Africa
70. Lindernia subracemosa DE WILD.	Scrophulariaceae	Chamaephytes	Intertropical and Oriental Africa
71. Dissotis senegambiensis (GUILL. et PERR.)	Melastomataceae	Phanerophytes	Intertropical Africa
72. Psidium guajava L.	Myrtaceae	Phanerophytes	Intertropical Africa and America.
73. Crassocephalum vitellinum (BENTH.) S. MOORE	Asteraceae	Therophytes	Intertropical Africa
74. Gomphocarpus physocarpus E. MEYER	Asclepiadaceae	Phanerophytes	Intertropical and South Africa; Mediterranean bassin
75. Rumex usambarensis (ENGL.) DAMMER	Polygonaceae	Geophytes	Intertropical and Oriental Africa

76. Cyathula polycephala BAKER	Amaranthaceae	Phanerophytes.	Intertropical and Oriental Africa
77. Phaseolus vulgaris L.	Fabaceae	Chamaephytes	Intertropical Africa, America and Asia

4. Conclusion

The ethnobotanic survey was carried out around Volcanoes National Park in the former sectors of Kinigi, Shingiro and Gataraga. Its principal goal was to know the medicinal plants used by the traditional healers surrounding this area. Moreover, knowing in advance the plants consumed by the gorillas (see appendix 4), this enabled us to know the medicinal plants consumed by the mountain gorillas in Volcanoes National Park. We found out 19 diseases and symptoms treated by nine traditional healers by using 77 species of plants grouped into 71 genera and 39 families with 78 medicinal receipts. In total, 19 plants gathered in 12 families were listed as being consumed by the mountain gorillas and used in traditional medicine by the surrounding traditional healers.

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