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Utilisation Of Weed Species As Sources Of Traditional Medicines In Central Kenya

Utilización de especies herbaceas de tradicion medicinal en Kenya central

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Abstract

Weed control measures and policies often view weedy plants as problem species that interfere with agricultural productivity. This results in these plants being eradicated sometimes indiscriminately without regard for their other economic importance. In rural Central Kenya however, people are turning to use of traditional medicinal plant species that include important weeds.

This study analyzed the use of weed species in contemporary traditional medicine in Central Kenya. The results show that 75 species in 34 plant families are used as sources of traditional medicine for 59 ailments. Informant consensus analysis for the ailments cited reveal that 32 of these ailments have a consensus factor of 0.5 and above. These weed species therefore deserve to be considered as important plants when Kenyan government is legislating problem plants species. In resource use efficiency variation and management of this variation are crucial and hence agrobiodiversity conservation strategies should include weedy species of medicinal value.

Indigenous as well as non-indigenous weed species were found to form part of the Central Kenya pharmacopoeia. This implies that traditional medicine in this region may be undergoing changing patterns as far as medicinal plant utilization is concerned. The medicinal weed species used for the treatment of ailments with high informant consensus need to be incorporated in agroecosystems in this region as domesticated plants or plants in the process of domestication. Further study of these plants especially phytochemical and pharmacological studies may contribute to development of important pharmaceutical products in future.

Key words: Biodiversity conservation, ethnobotany, medicinal plants

Resumen

Control de hierbas y politicas amenudo visualizan a las hierbas como un problema que interfiere con la productividad de la agricultura. El resultado es la erradicación de estas plantas algunas veces indiscriminadamente sin consideración por su otro valor económico. Sinembargo en areas rurales de Kenia central , la gente esta cambiando al uso de medicina tradicional que incluye la importancia de hierbas.

Este estudio analiza el uso de hierbas en contemporanea tradicion medicinal en Kenia central. Los resultados muestran 75 especies en 34 familias de plantas que son usadas como recurso de medicina tradicional para 59 alimentos. Analisis de información consensada para alimentos revelan que 32 de estos alimentos tienen un factor de consenso 0.5 y sobre este. Estas especies herbaceas merecen ademas ser consideradas como importantes plantas, cuando el gobierno de Kenia legisla sobre problema de plantas. En uso del recurso eficientemente, variación y manejo son cruciales y desde aquí la agrobiodiversidad se incluirian estrategias de conservación que incluyen las hierbas medicinales y su valor.

Plantas herbaceas indigenas y no indigenas fueron encontradas como parte de la farmacopea de Kenia central. Esto implica que la medicina tradicional en esta región puede ser llevada cambiando esquemas asi como la utilización de medicina concierne. Las hierbas medicinales usadas para el tratamiento de alimentos con alta información necesitan ser incorporadas en agroforestería en esta región como plantas domesticadas o plantas en el proceso de domesticación. Además estudios de estas plantas especialmente estudios de fitoquimica y farmacología pueden contribuir al desarrollo de importantes productos farmaceuticos en el futuro

Palabras clave: Conservación de la biodiversidad, etnobotanica, plantas medicinales

Introduction

Weeds are defined as any plants that are growing in unwanted areas or plants growing in permanently human-disturbed habitats but do not depend on human intervention for reproduction and survival. These plants may be found growing on agricultural fields and gardens or as ruderal plants (Ngugi et al. 1978; Stephen 1982; Casas et al.1996). Weeds are usually seen to have adverse effects not only in agricultural lands but also in natural wild ecosystems. In terms of agriculture these plants compete against crop plants for available resources, lower quality of agricultural produce, lower quality of pastures, some are poisonous, increase costs of production, harbor pests, while some block irrigation (Ngugi et al. 1978; Klingman et al. 1982; Ivens 1989; Cousens & Mortimer1995).

In regard to biodiversity conservation considerations weed and other invasive species are often perceived to act as "plant pests" (Miller 1999), one of the two major threats to biodiversity, second to habitat loss (Heywood 1995; Mungoro & Tezoo 1999). This may be especially so when weed species are adapted to fires, lack natural enemies, grow faster than indigenous plant species and produce plenty of seeds (Richardson et al. 1992). This consequently results in these plants being eradicated sometimes indiscriminately without regard for their other economic importance.

Modern agriculture leads to simplification of environmental structure by encouraging cultivation of few crop species, monocultural practices as well as extensive use of herbicides and other agrochemicals. On a global scale it is estimated that there are about 70 major crop plant species (Altieri 1994). This genetic uniformity in agriculture has created an artificial ecosystem that requires constant human interventions instead of being self-sustaining hence the need for increased diversity.

It is already realized that, the struggle to maintain biodiversity is going to be won or lost in agricultural systems. Consequently management of agricultural landscapes will be the litmus test of our ability to conserve species as most terrestrial biota will eventually have to coexist with human agriculture (Wood & Lenne 1999). Weeds are a component of plant genetic resources that when well protected in agroecosystems, can become useful plants or become crops themselves (Gladis 1996).

Weed species form a component of agrobiodiversity, playing a part in the ecology of natural enemies as in harboring and supporting many beneficial arthropod species that suppress pest populations consequently improving crop yields. Such weeds offer alternative prey/hosts, pollen or nectar and microhabitats for natural enemies (Altieri 1994). Crop fields with dense weed cover and high diversity usually have more predacious arthropods than do weed-free fields (Stephen 1982; Espanol 1976; Altieri 1994).

Weed science especially in Eastern Africa and other parts of tropical regions have tended to concentrate on ecology, taxonomy and control principles of general weed (Wild 1968; Terry et al. 1984; Terry & Michieka 1987; Baker & Terry 1991; Jiro, et al. 1997).

Management agencies in Eastern Africa are beginning to recognize the importance of invasive species and seek more information and tools to deal with the problems (Miller 1999). Data on the medicinal use of weeds. Recent studies in some African countries show that weed species have other economic importance often disregarded or unknown to policy makers. In South Africa, for example, medicinal plant species have been included as problem species. Consequently the importance of medicinal plant use will be taken into account when a plant is considered for listing as a declared weed or declared invader under the conservation of Agricultural resources act (Dold & Cocks 2000).

Ethnobotanical studies reveal how human beings have utilized plants for a wide diversity of primary survival and aesthetic purposes. It is a science that covers historical as well as present usage of plants (Nyazema 1996). Ethnbotanical studies are often significant in revealing locally important plant species especially for the discovery of crude drugs (Cox & Balick 1996; Flaster 1996). Such surveys also reveal the process of domestication which is a major evolutionary force bringing about different forms of plants through human selection (Casas, et al.1996). Ethnobotanical studies are also a suitable source of information regarding useful plants that can be targeted for domestication. Domestication of important medicinal plants in Eastern Africa has been seen as a way of increasing income and availability of the products to healers and other resource users (Dery & Otsyina 2000).

The study of African medicinal plants has not been realised as fully as other traditional communities elsewhere such as India (Iwu 1993). Consequently there is limited development of therapeutic products from African countries. With the increase of anthropogenic activities in many African countries deforestation is on the increase with consequent loss of important medicinal plants. In Kenya 2.9 million people live within 5Km of forest area exerting high pressure on the main forests such that out of the original closed canopy indigenous forest cover of 6.8 million hectares, only 1.24

hectares is left (Wass 1995). In view of the rapid loss of natural habitats, traditional community life, cultural diversity and knowledge of medicinal plants, documentation of African medicinal plants is an urgent matter (Wyk, et al. 2002).

Although the young people have absorbed large quantities of western culture, among the older people the remembrance of the past is live and the values, attitudes and behaviors typical of the traditional life are in many cases still carefully followed (Bottignole 1984). Such a culture has knowledge, which is transmitted from generation to generation usually orally. With modernization this transfer of knowledge is at risk.

This call for researchers in ethnobotany to take it upon themselves to document ethnobotanical knowledge from the older people and to teach it in institutions of higher learning.

A few Ethnobotanical studies have been done in Kenya targeting the different tribes and localities. The emphasis in the past has been on local uses of wild plants which often exclude weed species (Johns et al.1990; Kokwaro 1990; Msafiri 1994; Masinde et al. 1996; Maundu et al.,1999;Waiganjo 1999; Njoroge 2002; Njoroge & Newton 2002).

In rural Central Kenya people are turning to use of traditional medicinal plant species that include important weeds in this area. Several factors may be contributing to this trend in resource utillisation. At a national level, absolute poverty is the greatest challenge facing the country. In central Kenya the rural poor are turning to traditional plant remedies to solve medical problems as the prices of biomedicine have escalated to unaffordable levels. In some cases the medical facilities are inaccessible with only one or two government hospitals per district. Even where the medical facilities are accessible, the doctor/ patient ratio is very small, often reaching 1: 22,000 for outpatients (Ministry of finance and planing 2000, 2002).

UNICEF and WHO have since 1975 emphasized primary health care for all, an approach that was adopted at the Alma Ata international conference on primary health care of 1978. This approach encourages utilization of local human and material support available to a community to provide health care to the underserved population (Sindiga et al. 1995). This has gone some way in including traditional medicines, which are mainly of plant sources in providing accessible, affordable and socially relevant health care

While undertaking a larger Ethnobotanical field survey of the Kikuyu people who occupy most of Central Kenya, the main author realized that plant resource users often pointed out some weed species or another as important source of medicine. While that main study (on-going) aimed at looking at the important wild species of this region, the frequency with which the weeds were mentioned as good sources of medicines prompted the current study.

This paper aims at highlighting the current knowledge of the medicinal uses of weed plants in Central Kenya so as to point out what weed plants need careful consideration for conservation rather than eradication. The data are also useful in providing species that need to be re-evaluated for cultivation under controlled conditions hence increasing agrobiodiversity and accessible plant medicinal products.

Materials and Methods

Study Area

The Kikuyu people mostly occupy the Central province of Kenya, or otherwise referred to as the Kikuyu escarpment. Half of the 2.9 million Kenyans living within 5km of the forest are in Central Kenya (Wass 1995). This region has high population density and large concentration of forests, which are facing intense pressure due to over-utilization.

Interviews were conducted using a semi-structured questionnaire, detailed personal discussions with the local people and regular systematic walk in the fields to identify plants and collect Ethnobotanical specimens (Cunningham 2000). A total of 59 respondents were interviewed, these included males and females that depended on weed plant as sources of medicines either for self-medication or for treating others.

For each plant, information about all the possible medicinal uses was recorded including vernacular names. Voucher specimens were collected and are preserved at the Jomo Kenyatta University herbarium, Botany department while duplicates will be sent to the East African Herbarium (EA).

Results and Discussion

In this study a total of 75 weed species distributed in 34 families were reported to be medicinal ([[Table 1]], [[Appendix 1]]). Four families had particularly high percentage of medicinal weed species, Asteraceae (18.6%) ; Solanaceae (9.3%); Lamiaceae (9.3%) and Papilionaceae 6.6%. This may be a reflection of the world wide high number of species found in these families, Asteraceae 19,085, Solanceae 2,900, Lamiaceae 6,970 and Papilionaceae 12,615 (Zomlefer 1994). This may also be a reflection of some important chemicals present in these families and consequently the need for phytochemical analysis,

Family	Number of medicinal weed species	Percentage of total species mentioned as medicinal
Acanthaceae	1	1.3
Amaranthaceae	2	2.6
Amaryllidaceae	2	2.6
Anacardiaceae	2	2.6
Asclepiadaceae	1	1.3
Asparagaceae	1	1.3
Asteraceae	14	18.6
Basellaceae	1	1.3
Boraginaceae	1	1.3
Caesalpiniaceae	1	1.3
Chenopodiaceae	1	1.3
Commelinaceae	2	2.6
Cucurbitaceae	2	2.6
Cyperaceae	2	2.6
Ebenaceae	1	1.3
Euphorbiaceae	2	2.6
Lamiaceae	7	9.3
Malvaceae	2	2.6
Mimosaceae	1	1.3
Myritaceae	1	1.3
Oxadilaceae	1	1.3
Papilionaceae	5	6.6
Pedaliaceae	1	1.3
Poaceae	2	2.6
Polygonaceae	2	2.6
Portulacaceae	1	1.3
Rubiaceae	2	2.6
Rutaceae	1	1.3
Sapindaceae	1	1.3
Solanaceae	7	9.3
Urticaceae	1	1.3
Verbanaceae	3	4
Vitaceae	1	1.3

Table 1. Diversity of medicinal weed species In Central Kenya.
Tabla 1. Diversidad de hierbas medicinales en Kenia central.

As would be expected, medicinal weed species in this region is dominated by herbs, contributing 65.333% (49 species), while shrubs contribute 32% (24 species) and trees 2.667% (two species) [[(Figure 1]]).

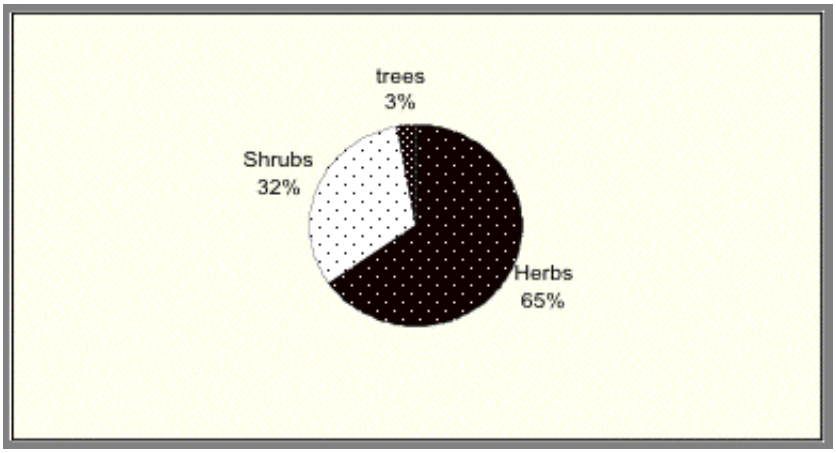

Figure 1. Life forms of medicinal weed species in Central Kenya.
Figura 1. Formas de vida de las hierbas medicinales en Kenia central.

Kenya's strategy for conservation of forests involves intensification of production of timber and other non-wood products outside forest areas (Njuguna, et al. 2000). Consideration of herb/weed species of medicinal value for such conservation activities is lacking in part due to lack of knowledge of their value. Some plant resource users in other developing countries have realized that community forestry is not a question of trees but should include on-farm non-timber forest products for subsistence as well as commercial purposes (Byron 1995; Maharjan 1995).
The results of this study will now provide information on medicinal weed species for possible on-farm conservation. Since most of them are herbs (Figure 1), they grow fast and therefore can provide a continuos supply of the medicinal products. When household needs are met the surplus can be sold for income generation. Some of these weed species are leguminous and hence will also contribute to soil fertility due to their ability to fix Nitrogen. The shrub weed species can be grown on farm edges or on the boundaries, where there is little interference with crop plants.
A look at the origin of the weed species reported to be medicinal show that not all are indigenous to East Africa or Africa in general ([[Appendix 2]]). While there are indigenous weed species utilized as medicinal sources in this region, there are many species that are of American , European and Asiatic origin in this pharmacoepia. This diversity is indicative of the changing patterns of medicinal plant resource utilization in Central Kenya. Some on the non-indigenous medicinal species have been given local (Kikuyu) names indicative of some medicinal character of the plant. A good example is *Schkuria pinnata* (Lam.) L. an American species now called "Gakuinini". This Kikuyu name implies "one with quinine", probably due to the bitter taste. It forms a significant place in the treatment of malaria in Central Kenya. Another interesting species is *Datura stramonium* L., called in Kikuyu "Mugurukia/ Kigurukia"which means "one that causes madness". Every respondent knew that this plant is poisonous and was quick to indicate that it is for external use, such as swellings, probably to relive pain.
A total of 59 ailments (Both human and veterinary)were reported to be treated/managed using weed species in this region. Of these ailments, 32 had informant consensus of 0.5 or more (Figure 2). This translates to about 54% all the ailments mentioned. The informant consensus factor has been viewed as an important indicator for targeting plant species for bioprospecting. The species therefore utilized in these 32 ailments can be targeted for phytochemical and pharmacological studies with the aim of identifying active ingredients for therapeutic purposes. Natural products and their derivatives represent over 50% of all the drugs in clinical use in the world (Wyk et al. 2002). In areas like this where the flora has not be comprehensively investigated for such products more natural products of clinical value can be identified.
When well managed near farms, the medicinal weed species especially those in Appendix 2 can be a valuable agrobiodiversity component in this region. The cultivation of weed medicinal plant species is a suitable option for optimizing resource utilization, as wells decreasing over-dependence on wild habitats. Encouraging such domestication will reduce pressure on wild habitats such as Mount Kenya and Aberdare forests, forming part of the solution to sustainable management of these ecosystems.

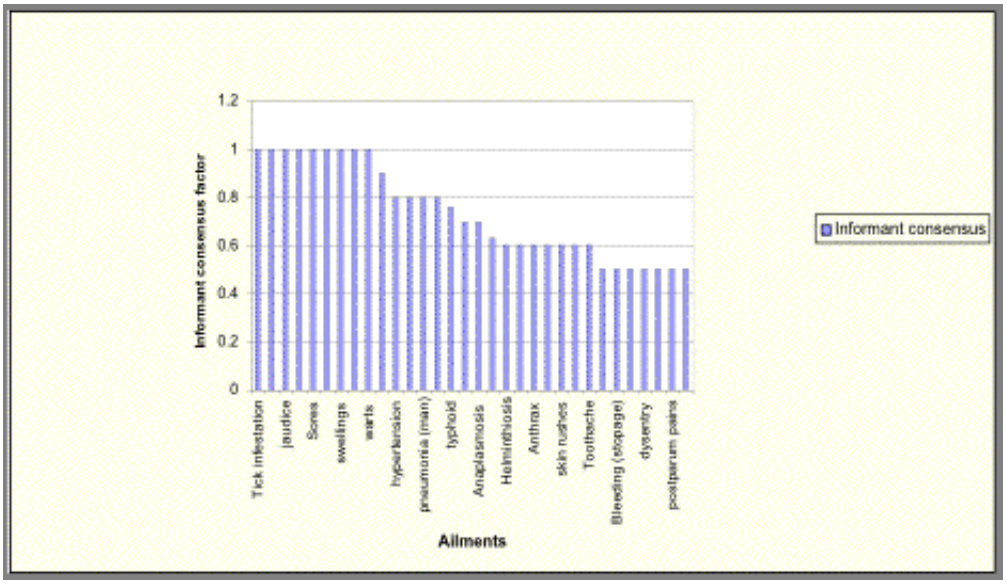

Figure. 2 Informant consensus for some ailments treated using weed species in Central Kenya.
Figura 2. Consenso Informativo de algunos alimentos tratados usando hierbas en Kenia central.

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Appendix 1. Checklist and uses of medicinal weed species in Central Kenya with informant consensus of 0.5

and above.

Anexo 1. Listado de plantas ruderales usadas como medicina en Kenia Central, con consenso de informante de 0.5 y mas.

Family	Scientific name	Vernacular name	Uses
Acanthaceae	*Hypoestes aristata* (Vahl) Roem. & Schultes	mituhia	Stomache
Amaranthaceae	*Achyranthes aspera* L.	mitegenye	Back pains, Anthrax, Toothache
Amaranthaceae	*Cyathula polycephala* Bak.	migwatang'ondu	Urinary problems
Amaryllidaceae/ Liliiflorae	*Ornithogalum tenuifolium* Delaroche / *O. longibrateatum*	Gi)ingiri k)a ngoma	Back pains; Tonsils(man)
Anacardiaceae	*Rhus natalensis* Krauss	mithigii	Back pains; Diarrhea; Anthrax; Postpartum pains; Toothache
Anacardiaceae	*Rhus vulgaris* Meikle	Mithira	Malaria
Asclepiadaceae	*Gomphocarpus semilunatus* A. Rich.	kaboco	Toothache
Asparagaceae/ Liliiflorae	*Asparagus setaceus* (Kunth) Jessop	rirura, mitumbae	Abscess; Diarrhea; Postpartum pains; Sores; Toothache; Wounds
Asteraceae	*Aspilia pluriseta* Schweinf.	Miit)	Antihelmintic; coagulant Anthrax; Pmples; Postpartum pains
Asteraceae	*Bidens polosa* L.	micege	Antihelhmintic; Coagulant; Diarrhea; Stomache upsets
Asteraceae	*Conyza pyrifolia* Lam.	Mitei, ibuca	Toothache
Asteraceae	*Conyza sumatrensis* (Retz.) E.H. walker	mikenga anake	Back pains; Diarrhea; Dysentry; Pimples; Postpartum pains; Stomache; Toothache
Asteraceae	*Emilia coccinea* (Sims) G. Don	G)tikia	Stomache
Asteraceae	*Helichrysum odoratissimum* (L.) Less	mitaa	Antihelmintic
Asteraceae	*Psiadia punctulata* (DC) Vatke	mwendathigo/mwendangw)ko	Diarrhea; STDs; Urinary problems

Asteraceae	*Schkuria pinnata* (Lam.) Thell.	Gakuinini	Colds/Flu; Malaria; Wound
Asteraceae	*Sonchus oleraceus* L.	Ihii r)a nyeni	Typhoid
Asteraceae	*Spilanthes mauritiana*	Gatharaita	Stomache; Toothache
Asteraceae	*Tagets minuta* L.	mibangi	Coagulant; Stomache; Toothache; Wound
Asteraceae	*Tithonia diversifolia* (Hemsl.) Gray	mariri	acariscide; Anaplasmosis; Malaria; Colds/Flu; Antihelmintic; Pimples; Stomache
Asteraceae	*Vernonia lasiopus* O.Hoffm.	micatha	Postpartum pains; Skin rashes; Stomache; Back pains; Diarrhea; Antihelmintic
Basellaceae	*Basella alba* L.	Mirerema	Diarrhea
Boraginaceae	*Cynoglossum coeruleum* A. DC.	minube	Skin rashes
Caesalpiniaceae	*Senna didymobotrya* (Fresen.) Irwin & Barneby	mw)ni	Back pains; Antihelmintic; Anaplasmosis; Malaria; Pimples; Pneumonia (cattle); Skin rashes; STDs; Stomache; Tonsils(man); Typhoid
Chenopodiaceae	*Chenopodium ambrosioides* L.	miiganjo	Wound
Commelinaceae	*Commelina africana* L.	mikengeria	Wound
Commelinaceae	*Commelina benghalensis* L.	mikengeria	Wound
Cucurbitaceae	*Cucumis aculeatus* Cogn.	gakingii	Malaria
Cucurbitaceae	*Zehneria scabra* (L.f.) Sond.	mahirira/ mwegethia	Colds/Flu; Hypertension
Cyperaceae	*Cyperus articulatus* L.	k)rago	Hiccups
Ebenaceae	*Euclea divinorum* Hiern	Mikinyai	Diarrhea; Anaplasmosis
Euphorbiaceae	*Tragia brevipes* Pax	Njegeni	Urinary problems
Euphorbiaceae	*Ricinus communis* L.	mwar)ki	Placenta problems; Skin rushes; Urinary problems

Lamiaceae	*Ajuga remota* Benth	wanjiru wa rir))	Colds/Flu; Antihelhmintic; Anaplasmosis; Malaria; Stomach upsets; Tonsils (cattle)
Lamiaceae	*Fuerstia africana* T.C.E.Fr	Gath)r)ga / gakiaito	Urinary problems
Lamiaceae	*Leonitis ocymifolia* (N.L. Burm.) Iwarsson /*Leonitis mollissima*	Micii, minyua cui	Diarrhea; Stomache; Urinary problems
Lamiaceae	*Ocimum basilicum* L.	Mitaa	Colds/Flu; Stomache
Lamiaceae	*Ocimum gratissimum* L.	Mikandu	Colds/Flu
Lamiaceae	*Plectranthus barbatus* Andr.	miigoya	Antihelhmintic; Abscess; Stomache; Warts
Malvaceae	*Hibiscus fuscus* Garcke	migere	Wound
Mimosaceae	*Acacia senegal* (L.) Willd.	Micemei	Skin rushes
Myritaceae	*Eucalyptus globulus* Labill.	mibai	Colds/Flu; Pneumonia (man); Pimples
Papilionaceae	Crotalaria agatifolia	Micingiri	STDs
Papilionaceae	*Dalbergia lactea* Vatke	mwaritha	Back pains
Papilionaceae	*Indigofera arrecta* A. Rich.	micigicigi, Michingiri	Skin rashes; Stomache
Pedaliaceae	*Sesamum calycinum* Welw	Ruta	Stomache
Poaceae	*Pennisetum clandestinum* Chiov.	nyeki/k)gombe w)tima	Jaudice; Tonsils(man); Urinary problems
Polygonaceae	Oxygonum sinuatum (Meisn.) Dammer	cong’e	Stomache; Toothache; Urinary problems
Portulacaceae	*Portulaca oleracea* L.	Gatumia	Typhoid
Rubiaceae	*Pentas longiflora* Oliv.	mihuha	Back pains; Malaria
Rubiaceae	*Rubia cordifolia* L.	gakaraki	Diarrhea; Antihelmintic
Rutaceae	*Toddalia asiatica* (L.) lam.	miririe	Back pains

Sapindaceae	*Dodonaea angustifolia* L.f.	Mirema-mithia	Pneumonia (man)
Solanaceae	*Datura stramonium* L.	Migirikia, K)girikia	Swellings; Tonsils(man)
Solanaceae	*Physalis peruviana* L.	minathi	Antihelhmintic; Postpartum pains; Typhoid
Solanaceae	*Solanum aculeastrum* Dunal	Mitira, G)tira	Back pains; Diarrhea; Tonsils(man); Toothache; Wounds
Solanaceae	*Solanum incanum* L.	Mitongu	Stomache
Solanaceae	*Solanum mauritianum* Scop.	Kaicoo	Skin rashes
Solanaceae	*Solanum nigrum* L	Managu	Typhoid fever
Solanaceae	*Withania somnifera* (L.) Dunal	Mirumbae	Coagulant; Colds/Flu; Postpartum pains
Urticaceae	*Urtica mossaica* Mildbr.	thabai	Colds/Flu; Hypertension; Pimples; Urinary problems
Verbanaceae	*Lantana camara* L.	Ri)thiki, mikig)	Colds/Flu; Malaria; Diarrhea
Verbanaceae	*Lantana trifolia* L.	Mikenia	Colds/Flu; Anaemia
Verbanaceae	*Lippia javanica* (Burm.f.) Spreng	Mithir)ti	Colds/Flu; Anaplasmosis
Vitaceae	*Cyphostemma maranguense* (Gilg) Desc.	minyanyange	Anaplasmosis; Malaria

Appendix 2: Diversity and origin of weed species used In Traditional Herbal Medicines in Central Kenya
Anexo 2. Diversidad y oirigen de especiees d eplantas ruderales usadas en Medicina Tradicional en Kenia Central.

Species	Family	Origin
Hypoestes aristata	Acanthaceae	Indigenous
Achyranthes aspera	Amaranthaceae	Indigenous , African
Cyathula polycephala	Amaranthaceae	Indigenous
Ornithogalum longibrateatum	Amarylidaceae	Indigenous
Crinum macowanii	Amaryllidaceae	Tropical & Subtropical
Rhus natalensis	Anacardiaceae	Indigenous

Rhus vulgaris	Anacardiaceae	Indigenous
Gomphocarpus semilunatus	Asclepiadaceae	Tropical & S. African
Aspilia pluriseta	Asteraceae	Mexico-Brazil, S.tropical Africa, Madagascar
Bidens pilosa	Asteraceae	Cosmopolitan, Panatropical
Conyza pyrifolia	Asteraceae	Indigenous
Conyza sumatrensis	Asteraceae	Indigenous
Emilia coccinea	Asteraceae	Paleotropic
Helichrysum odoratissimum	Asteraceae	Europe, Africa, Asia Australia
Lactuca capensis	Asteraceae	African
Psiadia punctulata	Asteraceae	Indigenous
Schkuhria pinnata	Asteraceae	American
Sonchus oleraceus	Asteraceae	Europe & N. Africa
Spilanthes mauritiana	Asteraceae	Indigenous
Tagetes minuta	Asteraceae	American
Tithonia diversifolia	Asteraceae	American
Vernonia lasiopus	Asteraceae	Indigenous
Basella alba	Basellaceae	Tropical Africa
Cynoglossum coeruleum	Boraginaceae	Indigenous
Senna didymobotrya	Caesalpiniaceae	Indigenous
Chenopodium ambrosioides	Chenopodiaceae	Tropical
Commelina africana	Commelinaceae	Indigenous Tropical
Commelina banghalensis	Commelinaceae	Indigenous Panatropical, cosmopolitan
Cucumis aculeatus	Cucurbitaceae	Indigenous
Zehneria scabra	Cucurbitaceae	Indigenous
Cyperus articulatus	Cyperaceae	Pantropical, Cosmopolitan
Kyllinga bulbosa	Cyperaceae	Indigenous
Euclea divinorum	Ebenaceae	Indigenous, African
Ricinus communis	Euphorbiaceae	Indigenous , African

Tragia brevipes	Euphorbiaceae	Indigenous
Ajuga remota	Lamiaceae	Old world
Fuerstia africana	Lamiaceae	Indigenous , tropical Africa
Leonitis mollisima	Lamiaceae	Indigenous
Ocimum basilicum	Lamiaceae	Tropical Asia
Ocimum gratissimum	Lamiaceae	Indigenous
Ocimum kilimandscharicum	Lamiaceae	Indigenous
Plectranthus barbatus	Lamiaceae	Indigenous
Asparagus setaceus	Liliaceae	Indigenous , Old world
Abutilon mauritianum	Malvaceae	Indigenous
Hibiscus fuscus	Malvaceae	Indigenous
Acacia senegal	Mimosaceae	Indigenous , Tropical & Subtropical
Eucalyptus globolus	Myritaceae	Australian
Oxalis latifolia	Oxalidaceae	S.America
Crotalaria agatiflora	Papilionaceae	Indigenous , Tropical & Subtropical
Crotalaria incana	Papilionaceae	Indigenous
Dalbergia lactea	Papilionaceae	Indigenous , Tropical & Subtropical
Indigofera arrecta	Papilionaceae	Indigenous
Tephrosia hildebrandtii	Papilionaceae	Indigenous
Sesamum calycinum	Pedaliaceae	Indigenous
Pennisetium clandesstinum	Poaceae	Indigenous
Sporobulus pyramidalis	Poaceae	Indigenous
Oxygonum sinuatum	Polygonaceae	Indigenous
Rumex abyssinica	Polygonaceae	Indigenous
Portulaca oleracea	Portulacaceae	N. Asia& S. Europe, cosmopolitan
Pentas longiflora	Rubiaceae	Indigenous
Rubia cordifolia	Rubiaceae	Indigenous
Toddalia asiatica	Rutaceae	Indigenous

Dodonaea angustifolia	Sapindaceae	AUSTRALIA? Tropical & Subtropical
Datura stramonium	Solanaceae	European, Asian, American
Physalis peruviana	Solanaceae	American
Solanum aculeastrum	Solanaceae	Indigenous
Solanum incanum	Solanaceae	Indigenous , African
Solanum mauritianum	Solanaceae	
Solanum nigrum	Solanaceae	European, Cosmopolitan
Withania somnifera	Solanaceae	Indigenous , African
Urtica massaica	Urticaceae	Indigenous
Lantana camara	Verbanaceae	American
Lantana trifolia	Verbenaceae	
Lippia javanica	Verbenaceae	
Cyphostemma maranguense	Vitaceae	Indigenous