

# Medicinal plants used to induce labour during childbirth in western Uganda

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## Abstract

Traditional medicine usage in rural Ugandan population for day-to-day health care needs is close to 90%. Women and children form the bulk of the people reliant on herbal medicine. This study was undertaken to document how ethnomedical folklore aids childbirth in rural western Uganda by conducting field surveys, discussions and interviews with the resource users (mothers) and health providers (traditional birth attendants). Health surveys revealed that over 80% of childbirths are conducted at home by using herbal remedies in Bushenyi district. Seventy-five plants have been recorded for usage in inducing labour and some of these plants may be oxytocic. The dilemma lies in the toxicity levels and the unspecified dosages that may threaten the life of the unborn baby and the mother. The high population growth rate, high total fertility rate coupled with high maternal mortality and morbidity in Uganda calls for rethinking in gendered health provision policies and programmes for which herbal medicine integration in health care systems seems viable.

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## 1. Introduction

In some rural areas in Uganda, traditional medicine usage for day-to-day health care needs is practiced by about 90% of the population. According to estimates by WHO, traditional medicine is practiced in 80% of the population in developing countries (Kamatenesi-Mugisha and Bukenya-Ziraba, 2002). The extensive use of traditional medicine, mostly medicinal plants, in rural Uganda is because people cannot afford western pharmaceuticals, and socio-culturally, traditional medicines have a wide acceptance. Kwesiga (2002) reported that the most important health worker for children is their mother and the popular health facility visited is the green pharmacy. Today, reports by the Ugandan Demographic and Health Survey indicate that the country's population growth rate is about 3.0% (CIA, 2002; UBOS, 2002), the total fertility rate is 6.9 (Tripp and Kwesiga, 2002; UDHS, 2000) and the number of the population is above 24 million people (CIA, 2002; UBOS, 2002; UNAIDS, 2002). This high fertility rate, however, is offset by high maternal mortality of 506 deaths per 100,000 live births, one of the highest

in sub-Saharan Africa as a whole (Neema, 2002). The national infant mortality is 97/1000 based on institutional records countrywide, excluding deaths in homes that are not recorded. A large population makes poor nations, like Uganda, practically incapable of providing proper basic health care needs and facilities for women, children and people with disabilities. In Uganda complications resulting from poor conditions related to reproductive health of the population, such as maternal mortality and morbidity, account for the number one top-most problem among the disease burdens (HSSP, 2000; NHP, 1999). The perinatal and maternal-related conditions occupy the first burden (20.4%), followed by malaria (15.4%), acute lower respiratory infections (10.5%), AIDS (9.1%), and diarrhoea (8.4%), which together account for over 60% of the total burden (HSSP, 2000; NHP, 1999). Culturally, the woman who has died during childbirth is equated to a soldier dying during a war, which undermines the status of women and right to medical care during pregnancy. In other words, sickness and death of an expecting mother is considered a normal and natural phenomenon that encourages the use of herbs, while undermining safe motherhood agenda in Uganda.

Although the majority of women receive antenatal care (91%), only 37% are supervised by trained health care workers (UDHS, 2000). Kamatenesi-Mugisha (2002) reported that in rural western Uganda, close to 80% of pregnant women

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deliver at home. They are helped to deliver mainly by traditional birth attendants, mothers-in-law, mothers, and friends. For instance, to complete the process of childbirth, herbal medicine is widely used to induce labour, removal of retained placenta and management of post-partum bleeding (Kamatenesi-Mugisha, 2004). This is an indicator that the health sector, with reference to women's reproductive health needs, in Uganda, is underdeveloped.

Women in Uganda are generally more disadvantaged than men, which is evident in the patriarchal order of communities (Kwesiga, 2002). The women have limited control of resources, such as land, money, household property, domestic animals and time, including the right to own children. The result is that most of the rural women in Uganda are in poor health in most cases due to prevalence of anaemia as a result of malaria and malnutrition, frequent pregnancies and child bearing, and sexually transmitted diseases, including HIV/AIDS (Neema, 1999).

The main objective of this study was to document the medicinal plants used by traditional medical practitioners in inducing labour, namely uterine contractions, during childbirth in and around Queen Elizabeth Biosphere Reserve, Uganda.

## 2. Methodology

### 2.1. Study area description

The study was conducted between April 2000 and March 2003 in Bushenyi and Kasese districts in western Uganda. This study was carried out in areas in and around Queen Elizabeth Biosphere Reserve (QEBR) and some other sub-counties such as Katerera, Kichwamba and Kitagata in Bushenyi district and the sub-counties of Munkunyu, Kayonza and Kitsinga in Kasese districts in western Uganda. Within Queen Elizabeth Biosphere Reserve, the fishing villages (human settlements) were sampled. These villages included Katwe, Mweya, Katunguru, Hamukungu, Kahendero and Kayanja.

Queen Elizabeth Biosphere Reserve is located in western Uganda. It was established in April 1952 as Queen Elizabeth National (Rwenzori) Park and designated as a Biosphere Reserve by UNESCO in November 1979. It straddles the Equator to the west of the rift valley and includes Lakes Edward and George, and the several salt lakes like Lake Katwe and Lake Nyamunuka. It lies within 00°15'S–00°10'N latitudes and 29°45'–30°05'E longitude. Lake George is a wetland, internationally recognised as a RAMSAR site. The biosphere reserve is about 2500 km<sup>2</sup> in size and is continuous with Kigezi Wildlife Reserve (330 km<sup>2</sup>), Kyambura Wildlife Reserve (157 km<sup>2</sup>), and Kibale Forest Corridor (339 km<sup>2</sup>), which form its buffer in Uganda. It is also continuous with Virunga National Park (8090 km<sup>2</sup>) that is located in the Democratic Republic of Congo. Kasese, Bushenyi, Rukungiri and Kabarole Districts in western Uganda share the biosphere reserve.

The ethnic groups found in the area of study are mainly the Bakonjo, Banyankole, Batooro, Banyaruguru, Baziba, Basongora, Congolese, Baganda, Banyarwanda and the Bakiga. The composition is highly mixed because of the migrants coming in for fishing, salt winning and various businesses, as well

as national park staff, all living in and around Queen Elizabeth Biosphere Reserve.

### 2.2. Community entry and ethnobotanical data collection methods

The research methods used were designed to promote free sharing of information between the researchers, the herbalists and other people. These methods are explained in the textbook of ethnobotany and others have been used in the field for this kind of study in Uganda and elsewhere in the world (Martin, 1995; Kakudidi et al., 2000; Kamatenesi-Mugisha et al., 2000; Kamatenesi-Mugisha and Bukenya-Ziraba, 2002; Kamatenesi-Mugisha, 2004). Therefore, informal conversations and semi-structured interviews and discussions, focused groups and individual discussions (FGDs, FIDs), health surveys and field visits were conducted to generate the ethnobotanical data (Martin, 1995).

To reach the traditional medical practitioners (TMPs) and traditional birth attendants (TBAs), the local authorities (Local Councils), herbalists associations in villages and chairpersons of wildlife clubs (CWCs) were consulted. When going to the forests, game reserve or other areas where they collect plant specimens, prior arrangements were made with the community leaders and park staff for approval and partly because of security reasons in the reserve. This ethnobotanical information was collected through visits to traditional healers to document their indigenous knowledge (IK) regarding medicinal plants used, ailments treated, gender and socio-cultural aspects. The main respondents during the study were traditional healers, traditional birth attendants (midwives), young women and elderly people of age ranging from 18 years to over 70 years. Over 160 respondents were interviewed and before recording the information and knowledge of the healers, prior informed consents were sought and the purpose of the study explained to the respondents. The common medicinal plants, mainly those that are consumed as food stuffs, were identified and documented during the fieldwork and henceforth they lack herbarium collection numbers. For the rest of the medicinal plants, voucher specimens were collected, each given an identification number, documented and later identified in the Makerere University Herbarium.

The informal conversations were held with the specialist resource users and other knowledgeable people. The meeting places were the gardens, women group meetings, at their homes, and any other places convenient to them. Through conversations, the sources of knowledge of the healers on medicinal plants, the medicinal plants used and changes in the availability of medicinal plants were established. Those who were more knowledgeable were later followed and interviewed further especially the traditional birth attendants (TBAs). Focused discussions with individuals or groups were held with the indigenous knowledge (IK) custodians for formal recording. This was done to verify the information gathered and the spread of IK in reproductive health care among the different reproductive groups.

The semi-structured interviews and discussions were held with the specialist resource users and other knowledgeable people by use of interview schedules for each respondent.

Interviewed people were mainly the herbalists (both men and women) and TBAs. The time and place of interviews were arranged according to the schedules of the respondent. Depending on where the interviews and discussions were held, recording was done immediately or afterwards or appointments were made for more details in a more convenient place arranged with the respondent. Key informants were identified, later interviewed separately and even followed for further details. Some of the key questions asked included, name of the respondents, the village or parish or sub-county he or she was coming from, diseases treated, plant local names used, parts harvested, methods of preparation and administration. In addition, ingredients and incantations with which the plants are used for preparation and where the herbal medicines were harvested were documented.

The field visits and excursions were arranged with the healers for places far from their homesteads or took place concurrently with the interviews and discussions. This was done with individuals or groups depending on where the herbs are collected. In the shared areas such as the fishing villages, or the multiple use areas, group and individual excursions were conducted. The data collected were to supplement the information on plant names, plant parts used, collection of the herbarium voucher specimens and conservation status of these medicinal plants.

The health centre surveys in government health centres were conducted to document IK regarding places of delivery for the pregnant women who visited the health centres for antenatal and immunisation services and during national polio immunisation days. These surveys were aimed at assessing the extent of utilisation of medicinal plants by traditional birth attendants (TBAs) during maternal health care delivery. The two modern basic health facilities of Kyambura and Katerera health centres were visited during antenatal and immunisation days. The pregnant and breast-feeding mothers who visited the health centres for antenatal and immunisation were interviewed. The interviews focused on each woman's total number of childbirths, place of childbirths and the persons who assisted them during childbirths in case of childbirths conducted at homes.

The medical ethnobotanical data collected has been analysed, medicinal plants from the study areas have been documented and methods of preparing and administering the herbal drugs were also documented. In checking for the proper updated naming, spellings and authors of the medicinal plants, besides using voucher specimens in Makerere University Herbarium,

several reference books and web-based information were used (Mabberley, 1990; Agnew and Agnew, 1994; Beentje, 1994; Katende et al., 1995; Katende et al., 1999; Maundu et al., 1999; Pamplona-Roger, 2000; IPNI, 2004).

### 3. Results

#### 3.1. Health centre survey of childbirth status

For the survey conducted at Kyenzaza health centre in Kichwamba sub-county in Bushenyi district, 285 women who visited these health facilities for immunisation and antenatal services were interviewed at different times, in order to establish the place of childbirth (Fig. 1). The interviewed women in Kichwamba represent 2.44% (285) of the total female population of 11,673 in Kichwamba sub-county, Bushenyi district (UBOS, 2002). A total of 198 women who came to Katerera health centre in Katerera sub-county in Bushenyi district, for immunisation and antenatal services were interviewed. The total number of women interviewed in Katerera represents about 1.0% of the total female population of 19,976 in Katerera sub-county, in Bushenyi district (UBOS, 2002). Over 80% of the women in Kichwamba and Katerera sub-counties in Bushenyi district had childbirths at home with the help of their mothers or mothers-in-law or traditional birth attendants (Fig. 1). Nearly all the women interviewed admitted having used herbs to maintain pregnancy, induce labour and aid the childbirth process. This reveals high dependence on herbal medication and much trust in traditional birth attendants and lack of modern maternal facilities and services in the rural countryside.

#### 3.1.1. Medicinal plants used in the induction of uterine contractions (oxytocics)

Seventy-five medicinal plant species and one fungus species mainly toadstool mushrooms in the family Tricholomataceae were documented as being used in inducing labour during childbirth (Table 1). The plants belong to 59 genera and 35 families. The commonest plant parts used are leaves (85.3%) including combinations with other plant parts. With regard to the conservation status, 68.4% (52) medicinal plant species are harvested from the wild populations, 17.7% (15) are under cultivation and 11.8% (9) are partly cultivated and or collected in the wild. All the cultivated medicinal plant species are consumed as food

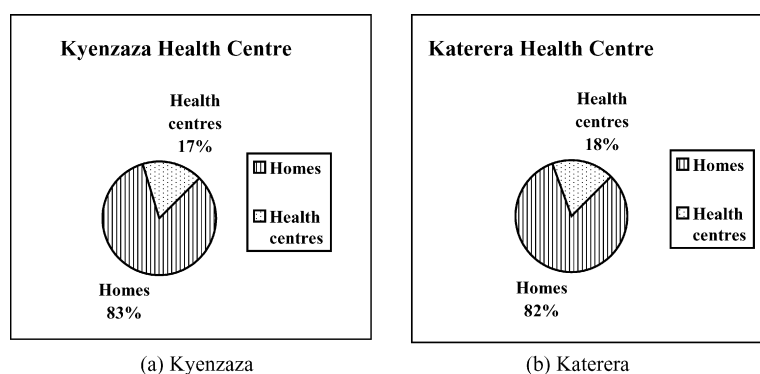


Fig. 1. Place of childbirth in communities around Kyenzaza and Katerera Health Centres in Bushenyi district.

Table 1  
Medicinal plants used to induce labour in western Uganda

Family and scientific name	Local name <sup>a</sup>	Parts used <sup>b</sup>	Conservation status	Collection number and collector <sup>c</sup>	Preparation	Administration
<b>Acanthaceae</b>						
<i>Justicia betonica</i> L.	Nnalongo (NY, RU, GA)	LF	W	29A	Squeezing by hand	Oral
<i>Justicia striata</i> (Klotzsch) Bullock	Kalazza (GA)	LF	W	7W	Squeezing by hand	Oral
<b>Alliaceae</b>						
<i>Allium cepa</i> Linn.	Katunguru (NY, KI, RU), Onion (EN)	BU, LF, TU	C	<sup>d</sup>	Chewing	Oral
<i>Allium sativum</i> Linn.	Tungurusumu (KO) Garlic (EN)	BU, LF, TU	C	<sup>d</sup>	Chewing	Oral
<b>Anacardiaceae</b>						
<i>Rhus vulgaris</i> Meikle	Mukanja (NY), Mukanza (RU)	BK, RT, LF	W	80B	Squeezing by hand, chewing	Oral
<b>Aracaceae</b>						
<i>Phoenix reclinata</i> Jacq.	Akakindo (NY), Mukindo (RU)	LF, RT	W	<sup>d</sup>	Chewing	Oral, smear on the belly
<b>Asteraceae</b>						
<i>Tagetes minuta</i> L.	Mukazimurofa (NY), Rwasesa (KO)	LF	W	1030	Squeezing by hand	Oral
<i>Laggera alata</i> Sch. Bip.	Ekyenyi Kyempitsi (NY)	LF	W	16A	Squeezing by hand	Oral
<i>Erlangea tomentosa</i> S. Moore	Ebyoganyanza (NY)/Ekyoganyanja (RU)	LF	W	25A	Squeezing by hand	Oral
<i>Crassocephalum crepidioides</i> (Benth.) S. Moore	Ekinami (NY)	LF	W	32B	Squeezing by hand	Oral
<i>Bidens pilosa</i> L.	Enyabarashana (NY), Omwisonya (KO), omwisonia (KO), Sere (KO, GA), Enyabarashani (RU)	LF, SE, FR, RT	W	33	Squeezing by hand, smoking in a pipe	Oral, inhale the fumes
<i>Vernonia amygdalina</i> Del.	Kibiriri (KO), omubirizi (NY, KI, RU), Mululuza (GA)	LF, RT	W	42, 52A	Squeezing by hand, chewing	Oral
<i>Acmella caulorrhiza</i> Del. (Syn. <i>Spilanthes africana</i> DC.)	Esiimwe (RU)	LF, FL	W	76b, MMK2	Squeezing by hand	Oral
<i>Helenium africanum</i> Kuntze	Chloroquine like-bitter plant (local nickname)	LF	W	7K	Squeezing by hand	Oral
<b>Boraginaceae</b>						
<i>Cynoglossum amplifolium</i> A. DC.	Ekitabatabe (RU)	LF	W	69B	Squeezing by hand	Oral
<b>Bromeliaceae</b>						
<i>Ananas comosus</i> Merr.	Enanasi (NY, KO, RU), Pineapple (EN)	FP	C	<sup>d</sup>	Squeezing by hand	Oral
<b>Caesalpinaceae</b>						
<i>Senna didymobotrya</i> Fresen.) H.S.Irwin & Barneby	Mugabagaba (NY), Mukyora (RU), Mucora (KO)	LF, RT	W	55B	Squeezing by hand, chewing	Oral
<b>Canellaceae</b>						
<i>Warburgia ugandensis</i> Sprague var. <i>ugandensis</i>	Mwiha (RU, NY)	BK, LF, RT	W	MMK3	Chewing, boiling	Oral
<b>Capparaceae</b>						
<i>Cleome gynandra</i> L.	Esobyoo/Amarera (KO), Eshogi (NY)	LF, RT, FL	C/W	32, 8A	Chewing	Oral
<b>Caricaceae</b>						
<i>Carica papaya</i> L.	Mapapari (NY, RU), Pawpaw (EN)	LF, RT, FR	C	<sup>d</sup>	Chewing	Oral
<b>Chenopodiaceae</b>						
<i>Chenopodium procerum</i> Moq.	Mukazimurungi (RU, KO), Muzumbazumbe (NY), Mujumbajumbe (NY)	LF, SE, FR	W	1042, 1007	Squeezing by hand	Oral
<b>Commelinaceae</b>						
<i>Commelina</i> sp.	Akateija (NY), Ekiteza (RU)	LF	W	<sup>d</sup>	Squeezing by hand	Oral, inserting piece in vagina
<i>Commelina erecta</i> L.	Eteija (NY), Enanda (KO)	LF	W	MMK4	Squeezing by hand	Oral, inserting piece in vagina

Table 1 (Continued)

Family and scientific name	Local name <sup>a</sup>	Parts used <sup>b</sup>	Conservation status	Collection number and collector <sup>c</sup>	Preparation	Administration
<b>Convolvulaceae</b>						
<i>Astripomoea</i> sp.	Bingire bita (NY, RU)	LF, SE	C/W	MMK-16 62B, 1008	Squeezing by hand	Oral
<i>Astripomoea grantii</i> (Rendle) Verdc.	Mukuzanyara, Sp. AE	LF	W		Squeezing by hand	Oral
<b>Brassicaceae</b>						
<i>Brassica oleracea</i> L.	Kabegi (NY, RU), Cabbage (EN)	RT	C	<sup>d</sup>	Chewing	Oral
<b>Cucurbitaceae</b>						
<i>Cucurbita pepo</i> L.	Bishusha (RU), Byozi (NY), Pumpkins (EN)	LF, FR, RT, SE	C	<sup>d</sup>	Squeezing by hand, chewing	Oral
<i>Luffa cylindrica</i> (L.) M.J. Roem.	Ekyangu (NY), Ekyangwe (KO)	LF, FR, RT	C/W	49A	Squeezing by hand, chewing	Oral
<b>Dracaenaceae</b>						
<i>Dracaena fragrans</i> Ker Gawl.	Mugorora (NY, RU)	LF, RT	W	84B	Squeezing by hand, chewing	Oral
<b>Euphorbiaceae</b>						
<i>Croton megalocarpus</i> Hutch.	Mutugunda (NY)	RT	C	<sup>d</sup>	Squeezing by hand	Oral
<i>Euphorbia tirucalli</i> L.	Ruyenze (NY, RU)	LF, RT, ST	C/W	<sup>d</sup>	Squeezing by hand, chewing after roasting	Oral
<i>Ricinus communis</i> L.	Kashogashoga/Kishogashoga (NY, RU) Enkarakari (KO)	LF, RT, FR	W	26A	Squeezing by hand, chewing	Oral
<i>Acalypha psilostachya</i> Hochst. ex A.Rich.	Muzarirahamwe (NY, RU)	LF	W	54A	Squeezing by hand	Oral
<i>Euphorbia hirta</i> L.	Mpangura (RU), Asthma weed (EN)	WP	W	5KAT	Squeezing by hand, chewing	Oral
<i>Euphorbia prostrata</i> Ait.	Obunyunyambu (NY)	WP	W	7A	Squeezing by hand, chewing	Oral
<b>Lamiaceae</b>						
<i>Plectranthus prostratus</i> Guerke	Mubiru/Namubiru (GA, KO), Bwizibwingi/Maizimarungi (NY)	LF	W	13A	Squeezing by hand	Oral
<i>Ocimum lamiifolium</i> Benth.	Omweya (RU), Omwenyi/Omwenye Mushaija (NY)	LF, FR	W	28C	Squeezing by hand	Oral
<i>Solenostemon latifolius</i> (Benth.) J.K. Morton	Kizera (NY), Kicuncu (RU)	LF	W	2A	Squeezing by hand	Oral
<i>Ocimum gratissimum</i> L.	Mujaja (NY)	LF	W	41, 35A	Squeezing by hand	Oral
<i>Leucas martinicensis</i> (Jacq.) Ait.f.	Kacumucumu (NY)	LF	W	53A	Squeezing by hand	Oral
<i>Tetradenia riparia</i> (Hochst.) L. E. Codd	Mutubya (KO), Muravunga (NY), Murajunga (RU), Kyewamara (KO, GA)	LF	W	5A	Squeezing by hand	Oral
<i>Leonotis nepetifolia</i> (L.) R.Br.	Kicumucumu (NY), Kifumufumu (KO)	LF	W	K14, 31A	Squeezing by hand	Oral
<b>Malvaceae</b>						
<i>Sida cuneifolia</i> Roxb.	Obweyeyo (NY)	LF	W	24A	Squeezing by hand	Oral
<i>Sida rhombifolia</i> L.	Mucundezi (NY)	LF	W	MMK1	Squeezing by hand	Oral
<b>Menispermaceae</b>						
<i>Cissampelos mucronata</i> A. Rich.	Kavamagombe (KO)	LF, RT	W	<sup>d</sup>	Squeezing by hand, chewing	Oral
<b>Mimosaceae</b>						
<i>Albizia gummifera</i> C.A. Smith	Mushebeya (RU), Murera (KO)	LF	W	34A	Squeezing by hand	Oral
<i>Albizia zygia</i> (DC.) Macbr.	Muragaza (NY)	LF	W	63B	Squeezing by hand	Oral
<b>Musaceae</b>						
<i>Musa paradisiaca</i> L.	Plantain for cooking (EN), Entaragaza (NY)	RT	C	<sup>d</sup>	Squeezing by hand, chewing after roasting	Oral
<i>Musa acuminata</i> Colla	Banana (EN)	RT	C	<sup>d</sup>	Squeezing by hand, chewing after roasting	Oral

Table 1 (Continued)

Family and scientific name	Local name <sup>a</sup>	Parts used <sup>b</sup>	Conservation status	Collection number and collector <sup>c</sup>	Preparation	Administration
<b>Myrsinaceae</b>						
<i>Maesa lanceolata</i> Forssk.	Muhanga (NY)	LF, BK	W	20A	Squeezing by hand, chewing	Oral
<b>Papilionaceae</b>						
<i>Indigofera spicata</i> Forssk.	Kibwankurata (RU)	LF	W	1008, A1	Squeezing by hand	Oral
<i>Indigofera arrecta</i> A. Rich.	Musoroza (NY), Mukaliza (KO)	LF, RT	W	28A, 70B	Squeezing by hand, chewing	Oral
<i>Cajanus cajan</i> (L.) Millsp.	Ntondigwa (NY), Enkolimbo (RU), Empinamuti (KO, RU)	LF	C	38A	Squeezing by hand	Oral
<i>Erythrina abyssinica</i> Lam.	Murinzi (RU), Kiiko (NY)	LF, BK, FL	W	67B	Squeezing by hand, chewing	Oral
<b>Poaceae</b>						
<i>Pennisetum purpureum</i> Schum.	Kibingo (NY), Elephant grass (EN)	LF, SH	C/W	<sup>d</sup>	Squeezing by hand, chewing	Oral, smear in belly
<i>Cymbopogon nardus</i> (L.) Rendle	Mutete (NY)	LF, ST, RT	W	18A	Squeezing by hand, chewing	Oral
<b>Rubiaceae</b>						
<i>Vangueria apiculata</i> K. Schum.	Ntugunda (RU)	RT	C/W	<sup>d</sup>	Squeezing by hand, chewing	Oral
<i>Spermacoce princeae</i> (K. Schum.) Verdc.	Kishakimwe (NY)	LF	W	11C	Squeezing by hand	Oral
<b>Rutaceae</b>						
<i>Zanthoxylum gillettii</i> (De Wild.) Waterman	Muremankobe (RU), Mutatembwa (RU)	BK, RT	W	<sup>d</sup>	Squeezing by hand after pounding, chewing	Oral
<b>Solanaceae</b>						
<i>Capsicum frutescens</i> L.	Kamurari (GA), Eshenda (NY)	LF, SE, FR	C	<sup>d</sup>	Squeezing by hand, chewing	Oral
<i>Lycopersicon esculentum</i> Mill.	Nyanya (NY, RU), Tomatoes (EN)	LF, RT	C	<sup>d</sup>	Squeezing by hand, chewing	Oral
<i>Nicotiana tabacum</i> Linn.	Taabe (NY), Tobacco (EN)	LF	C	<sup>d</sup>	Squeezing by hand, chewing after roasting	Oral
<i>Physalis peruviana</i> L.	Kitutu (NY)	LF	C/W	<sup>d</sup>	Squeezing by hand	Oral
<i>Solanum indicum</i> L.	Ntakara (NY, KI), Katula (KO)	LF, FR	C/W	<sup>d</sup>	Squeezing by hand, chewing	Oral
<i>Physalis minima</i> L.	Ntuutu (NY), Buzarirahamwe (RU)	LF	W	24C	Squeezing by hand	Oral
<i>Solanum terminale</i> Forssk.	Muhanura nkuba (NY)	LF, RT	W	25C	Squeezing by hand, chewing	Oral
<i>Solanum aculeatissimum</i> Jacq.	Ntobotobo (NY, RU)	SE, FR	W	49K	Squeezing by hand after roasting	Oral
<b>Ternstroemiaceae</b>						
<i>Thea sinensis</i> L.	Tea (EN), Majani (NY, RU, KO)	LF	C	<sup>d</sup>	Squeezing by hand	Oral
<b>Tilliaceae</b>						
<i>Triumfetta longicornuta</i> Hutch. and Moss	Ruhigura (NY)	LF, RT	W	27A, 77B	Squeezing by hand, chewing	Oral
<i>Triumfetta rhomboidea</i> Jacq.	Ruhigura (NY)	LF, RT	W	33B	Squeezing by hand, chewing	Oral
<b>Urticaceae</b>						
<i>Ficus natalensis</i> Hochst.	Eriremya (KO), Mutoma (NY, RU)	LF, AR	W	1022	Squeezing by hand, chewing	Oral
<b>Verbenaceae</b>						
<i>Clerodendrum myricoides</i> (Hochst.) Vatke	Kikuzumburi, Mukuza nyana	LF	W	22A	Squeezing by hand	Oral
<i>Clerodendrum rotundifolium</i> Oliv.	Ekishekashekye (NY), Nkanyahe (KO), Musekeseke (TO)	LF	W	29C	Squeezing by hand	Oral

Table 1 (Continued)

Family and scientific name	Local name <sup>a</sup>	Parts used <sup>b</sup>	Conservation status	Collection number and collector <sup>c</sup>	Preparation	Administration
Vitaceae						
<i>Cyphostemma adenocaula</i> Descouings. ex Wild & R.B.Drumm.	Kibombo/Bombo, Kimara (NY)	LF, RT	W	55	Squeezing by hand, chewing	Oral
Zingiberaceae						
<i>Zingiber officinale</i> Roscoe	Ntangahuzi (RU, NY), Ginger (EN)	TU	C	<sup>d</sup>	Chewing	Oral

<sup>a</sup> Dialects: EN (English); GA (Luganda); KI (Rikiga); KO (Rukonjo); NY (Runyankole); RU (Runyaguru); TO (Lutooro).

<sup>b</sup> Plant parts: AR (aerial roots); BK (bark); BU (stem bulb); FL (flowers); FR (fruits); LF (leaves); FP (fruit peelings); RT (roots); SE (seeds); SH (sheath); ST (stem); TU (root tuber); WP (whole plant).

<sup>c</sup> Voucher specimen collector and collection numbers were by Dr. Maud Kamatenesi-Mugisha.

<sup>d</sup> Documented and identified medicinal plants during field work without voucher specimens.

except tobacco, which is for smoking. The medicinal plants that are partially domesticated and wild 50% (4) are food for human beings and these include *Physalis peruviana*, *Solanum indicum* and *Cleome gynandra*. The other medicinal plant species that are partially domesticated and wild such as *Pennisetum purpureum*, *Phoenix reclinata* and *Euphorbia tirucalli* are used widely as fencing materials and animal fodder. The most common methods of use and preparation of the medicines are by squeezing or chewing fresh plants (98.7%) and the rest of the preparation methods namely boiling and smoking in a pipe constituted 1.3%. The most common method of administration of herbal medicines was by giving infusions orally and the other routes of administration namely smearing on the belly, inserting in the vagina and smoke inhalation constituted about 6.6%. The plant species applied topically by smearing on the stomach of the pregnant woman in labour were *Pennisetum purpureum* Schum., and *Phoenix reclinata* Jacq., while a piece of stem of *Commelina erecta* L., is administered by insertion in the birth canal.

#### 4. Discussion

Most of the plants claimed to be oxytocics are used to induce and maintain labour, help remove the retained placenta, regulate post-partum bleeding and as abortifacient. These plant species increase the spontaneous activity of the uterus causing increase in contractions (Kamatenesi-Mugisha, 2004). Some animal products are also used in inducing labour and in the removal of retained placenta such as *Hippopotamus amphibius* (skin and meat) and *Panthera leo* (fats and faeces), which are boiled and the cooled decoction taken orally.

Medicinal plants used to speed birth are usually taken towards the end of gestation period or at the on-set of labour pains. Plants that produce uterine contractions have similar action as that of oxytocin hormone, produced on the posterior lobe of the hypophysis, which stimulates the uterus, experience strong contractions, thus producing labour (Pamplona-Roger, 2000). The traditional birth attendants, mothers-in-law, mothers, or the expecting mother herself (self-medication) mainly prescribe these herbal remedies to induce labour. Some of these medicinal plants are also fed to cows and goats in labour. Some healers use these herbs to make a local medicinal capsule called

“*Emumbwa*”, made from clay mixed with the herbs, then dried for use at any time when a woman is in labour. Special containers made of clay are used to crush this capsule and mixing it with water for oral administration. *Emumbwa* is widely used in commercial centres, towns and big cities where plants that can be used to quicken birth are not easily obtained and hence a business for the traditional birth attendants and other herbal medicine vendors, who live in towns and cities (Kamatenesi-Mugisha, 2004). Pamplona-Roger (2000) reported that if such oxytocic plants are used during the first months of pregnancy, they could induce an abortion. This has been observed with some medicinal plants such as *Vernonia amygdalina* Del.

Some of these plant species documented were found to be used elsewhere in Uganda and other countries. For instance, *Cleome gynandra* is widely used in hastening childbirth (Oryem-Origa et al., 2003). A herbal drug made up of *Cleome gynandra* is used to fasten childbirth (Tabuti, 2003) widely throughout the entire country, which may imply that the plant may be potent (Kamatenesi-Mugisha, 2004). Chagnon (1984) reported that the methanolic extract of *Bidens pilosa* showed weak uterine stimulant effects on the guinea pig uterus in Rwanda. In addition, the water-methanolic plant of *Iboza riparia* extract showed weak activity on guinea pig uterus stimulation and weak activity on guinea pig ileum smooth muscle (Goto et al., 1957). Chagnon (1984) further reported that the methanolic extract of *Iboza riparia* relaxed toad skeletal muscle (*Rectus abdominus*), caused weak guinea pig ileum smooth muscle relaxation and weak guinea pig uterine stimulation effect. *Luffa cylindrica* seeds were reported to be abortifacient (Saha et al., 1961; Ng et al., 1992). Awe et al. (1999) reported that the infusion of leaves of *Vernonia amygdalina* are used as abortifacient in women. The methanolic extract of *Vernonia amygdalina* showed weak relaxant activity on the smooth muscle of the guinea pig ileum (Chagnon, 1984). Furthermore, other *Erlangea* species such as *Erlangea cordifolia* dried and fresh leaves are used to induce labour during childbirth in Kenya (Mugo, 1977). The ethnopharmacological studies reflecting these medicinal plants used in childbirth or for inducing abortion implies that some of these plants can hasten childbirth hence are probably oxytocics.

Some plants used by TBAs may also have harmful effects, when taken in larger quantities can lead to the death of the unborn

baby and/or rupturing of the uterus (Kamatenesi-Mugisha, 2004). The fact that almost all plant species used to induce labour are administered orally has far reaching implications to the mother and the unborn child, including the death of the mother in case of wrong dosages. Although no studies have been carried out specifically to examine the relationships between high maternal mortality in Uganda and high dependence on herbs during childbirth, a positive linkage is suspect and requires further research.

## 5. Conclusions

The persistent use of plants by pregnant women and traditional birth attendants in inducing labour, is indicative that some of the herbs are potent, which may guide the discovery of new oxytocics. In societies relying heavily on verbal communication (Posey, 2002) and natural herbal pharmacopoeias, it is vital to tap and document the local healing knowledge and ethnomedical folklore on use of medicinal plants. Further field and laboratory research are urgently needed to establish the appropriate dosage levels, presence of toxicity and efficacy in order to address the current crisis and mysteries surrounding maternal and infant mortality at birth in Uganda. The current high Ugandan maternal mortality of 506 deaths per 100,000 live births, calls for rethinking in the gendered health provision programmes, safe motherhood programs for the majority of Ugandan women are still far from a reality. Scientific investigations that can provide guidance in setting up health policies in the reproductive health care, as well as collaborative approaches involving traditional medical practitioners such as traditional birth attendants, is long overdue. Possibly, the lack of more profound knowledge on plant species used to induce uterine contractions and to speed up childbirth is one of the factors that contribute to high maternal mortality in Uganda.

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