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AN ETHNO-BOTANICAL STUDY OF GABRA PLANT USE IN MARSABIT DISTRICT, KENYA

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ABSTRACT

This paper reports on the results of several research trips made to the Chalbi Desert area of Marsabit District, northern Kenya, between 1979 and 1983 to study various ecological and social aspects of Gabra life. We report here specifically on the preliminary results of an analysis of Gabra plant use. The research was conducted in collaboration with the UNESCO Integrated Project on Arid Lands and this study provides supplemental data for their Technical Report series of publications.

INTRODUCTION

The Eastern Cushitic Gabra are an Oromo-speaking people closely related to the Booran. One point of ideological differentiation between the two groups focuses on livestock: the Gabra depend mainly on camels and the Booran are cattle people. The approximately 30,000 Gabra occupy a large area about the size of Switzerland (40,000 km^2) (Fig. 1) between Lake Turkana in the west and the Bule Dera plain in the east, the Mega escarpment in Ethiopia to the north and an ill-defined southern limit running from the Marsabit highlands northwest across the Chalbi Desert towards the Chari Ashe hills (Fig. 2). Territorial boundaries with neighbouring pastoral groups fluctuate (Stiles, 1981).

The ecology of nomadic pastoralism is extremely complex. In a simplified way one could say that traditional pastoralists are in a never-ending search for pasture and water for their livestock, and that settlement distribution and movement are related to where these necessities can be found. The type, abundance and quality of plant species vary according to soils and rainfall, and also by the season. Different livestock animals have different forage needs in general, and these also vary according to the seasons (mainly defined as either wet or dry).

People too have needs for plants, as medicine, for construction, food, for household utensils and tools, for ritual ceremonies and for firewood. The location of certain plant species is thus also of interest to man himself.

Climate

The climate of the Chalbi Desert region is the driest in East Africa. Rainfall is extremely variable from year to year, averaging roughly 150–200 mm annually at 500 m altitude and rising to around 1000 mm at 2000 m. Potential evaporation in the lowland areas is in the order of 2500 mm a year (Bake, 1983),

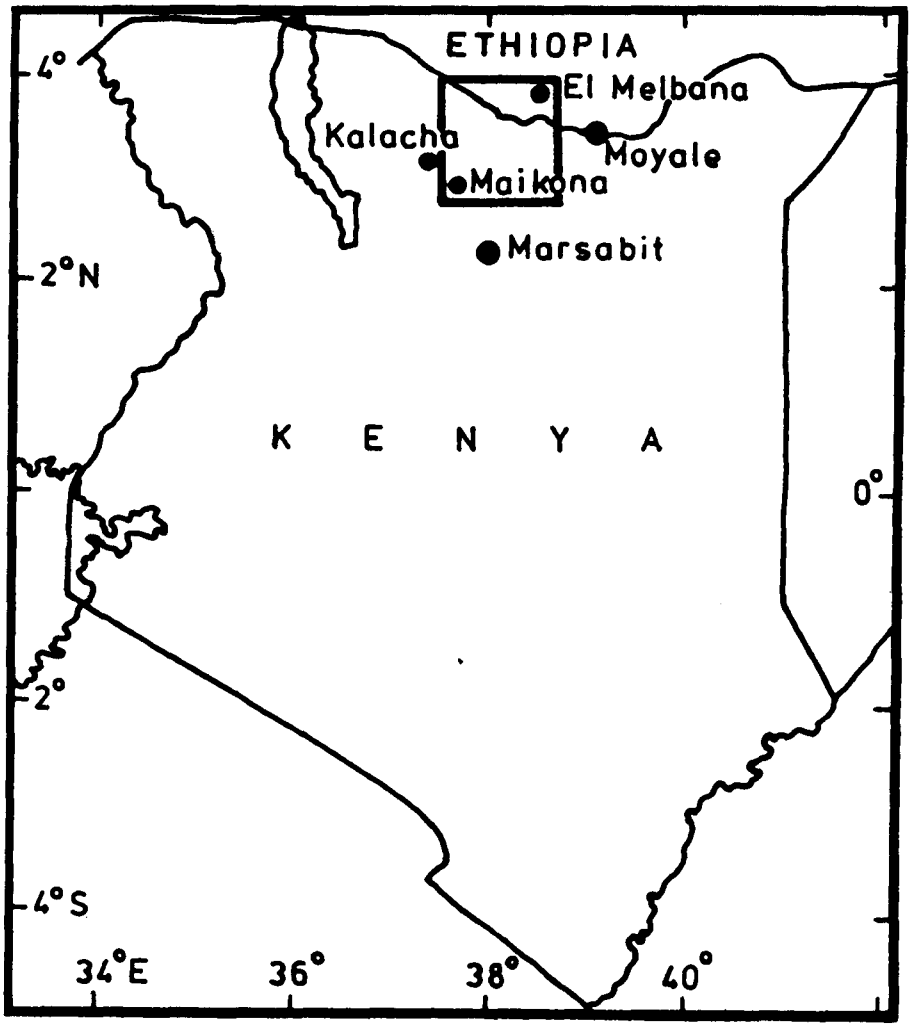

Figure 1. Map of Kenya showing study area (in square)

thus there is a very large water deficit, making rainfed cultivation impossible. Even in areas of over 1200 m altitude, agriculture is an uncertain occupation, as demonstrated by the Konso on the Hurri Hills where only one harvest out of three meets the needs of the people (personal observation).

Northern Kenya experiences the eastern African system of northeast and southeast monsoons. The southeast monsoon, which originates over the Indian Ocean, brings the most moisture and the probability for rain is highest between the end of March and early June, with a peak in April. The northeast monsoon, originating over the Arabian region, brings less moisture with the highest probability of rain in November. July through September and December to March are normally very dry months (Ojany & Ogendo, 1982; Edwards *et al.*, 1979).

In the Chalbi Desert the wind direction is almost always from the east or southeast and it blows very strongly, increasing potential evaporation and aeolian erosion. Temperatures are high, reaching 45°C in the shade during the driest months at 450 m altitude, though the mean daily maximum temperature at Kalacha (500 m) is about 38°C (Herbert Anderson, personal communication).

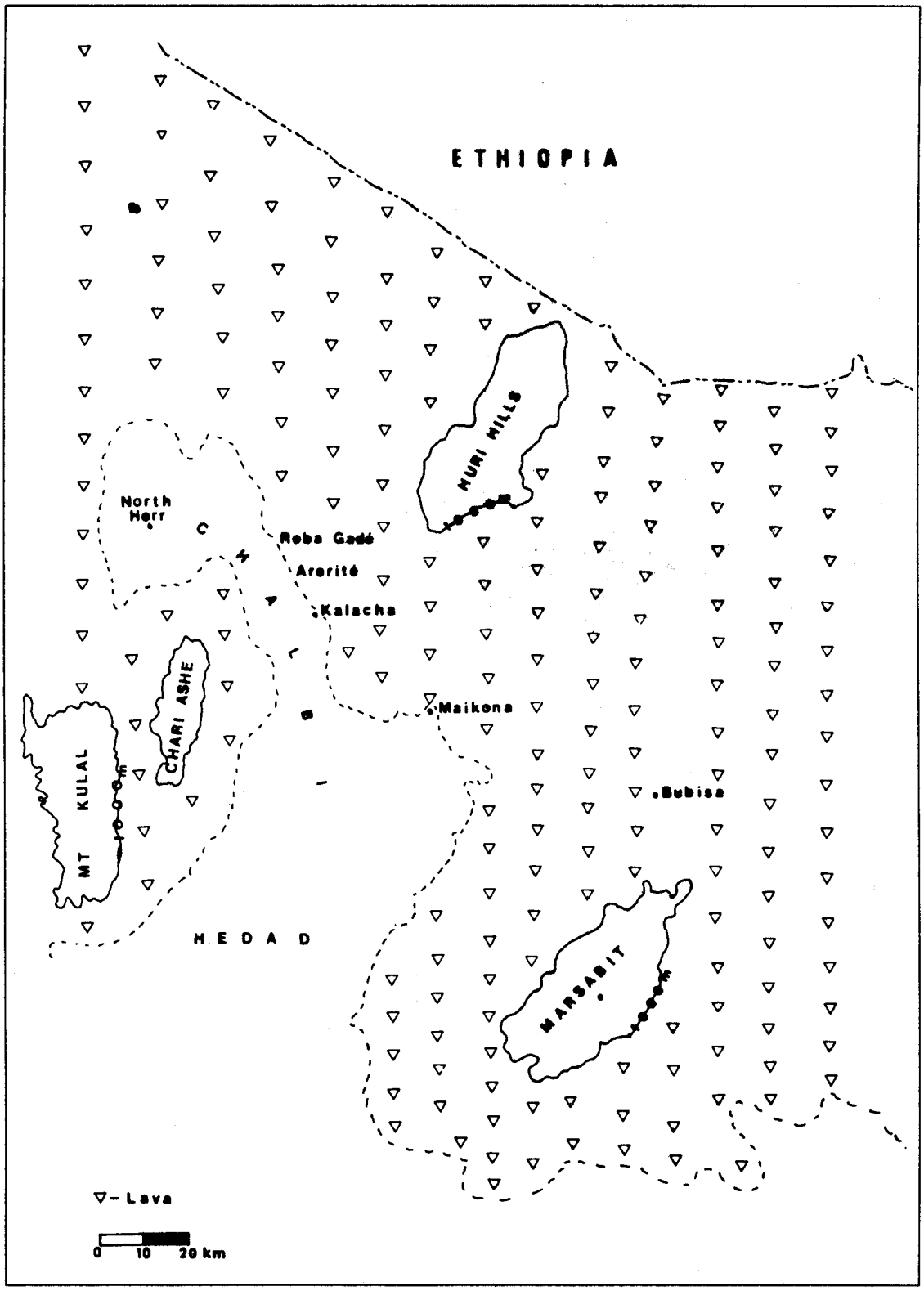

Figure 2. Map of area of northern Kenya occupied by the Gabra

Vegetation

Some of the more detailed descriptions of vegetation in the Gabra area include Edwards (1940, 1945), Pratt *et al.* (1966), Pratt & Gwynne (1977) and FAO (1971). Herlocker (1979) presents the most detailed description and mapping of the plant communities and is the only study based on field work, except for a brief survey conducted by FAO. Following Herlocker (1979), the main primary and tertiary vegetation types sampled in our study were:

Forest	-	Lowland groundwater (*Hyphaene*) (2) [1]
Shrubland	-	Evergreen (*Suaeda*) (20)
	-	Evergreen with occasional perennial grasses (*Salvadora* with *Sporobolus spicatus*) (22)
	-	Deciduous (*Acacia mellifera* / *A. seyal* / *Commiphora*) (26)
Dwarf shrubland	-	*Duosperma* (34)
Perennial grassland	-	Upland (*Chrysopogon*) (46) and (*Panicum* / *Chrysopogon*) (48)
	-	Wooded upland (*Aristida* / *Chrysopogon* / *Pennisetum* with *Erythrina*) (51)
Annual grassland	-	Bushed dwarf shrub: short (*Aristida* / *Enneapogon* with *Acacia reficiens* - *Indigofera*) (64)
	-	Wooded dwarf shrub: short (*Aristida* with *Acacia tortilis* - *Lagenantha*) (70)
Barren land (73)		

The largest area of the study sampling zone was covered by type 64, then type 70, followed by type 34. The Chalbi Desert itself is type 73, with various halophytic plants occurring in some places (Fig. 3).

Most of the study area falls within eco-climatic zone VI (very arid) of Pratt & Gwynne (1977), with a small area in the Hurri Hills in eco-climatic zone V (arid).

Topography and soils

The Chalbi Desert (Fig. 2) a former lake, is a depression of some 950 km^2 in an area forming the sump of an interior drainage system covering 36,615 km^2. The relatively flat surface of the Chalbi averages 450-480 m a.s.l. The ground rises to the northeast from lacustrine sediments onto volcanic plain which slopes up to the Hurri Hills (1685 m). This volcanic plain extends to the east and southeast and crosses to the north of the Marsabit highlands (Dida Galgallo plain). The Chari Ashe hills rise to 1165 m on the western side of the Chalbi Desert, and to the southwest lies Mt. Kulal (2335 m), a former volcano. These highlands lie between the central and southern Chalbi Desert and Lake Turkana (410 m). The northern part of the Chalbi desert is separated from the lake by an intervening dissected lava plateau of approximately 700 m in altitude.

The vegetation sampled in this study lies on one of four soil types (Sombroek *et al.*, 1982):

1. M7 - well drained rocky and stony Cambisols, with inclusions of rocky vents (lower part of Hurri Hills).

[1] The numbers in parentheses are those used in the Herlocker (1979) tertiary vegetation types system.

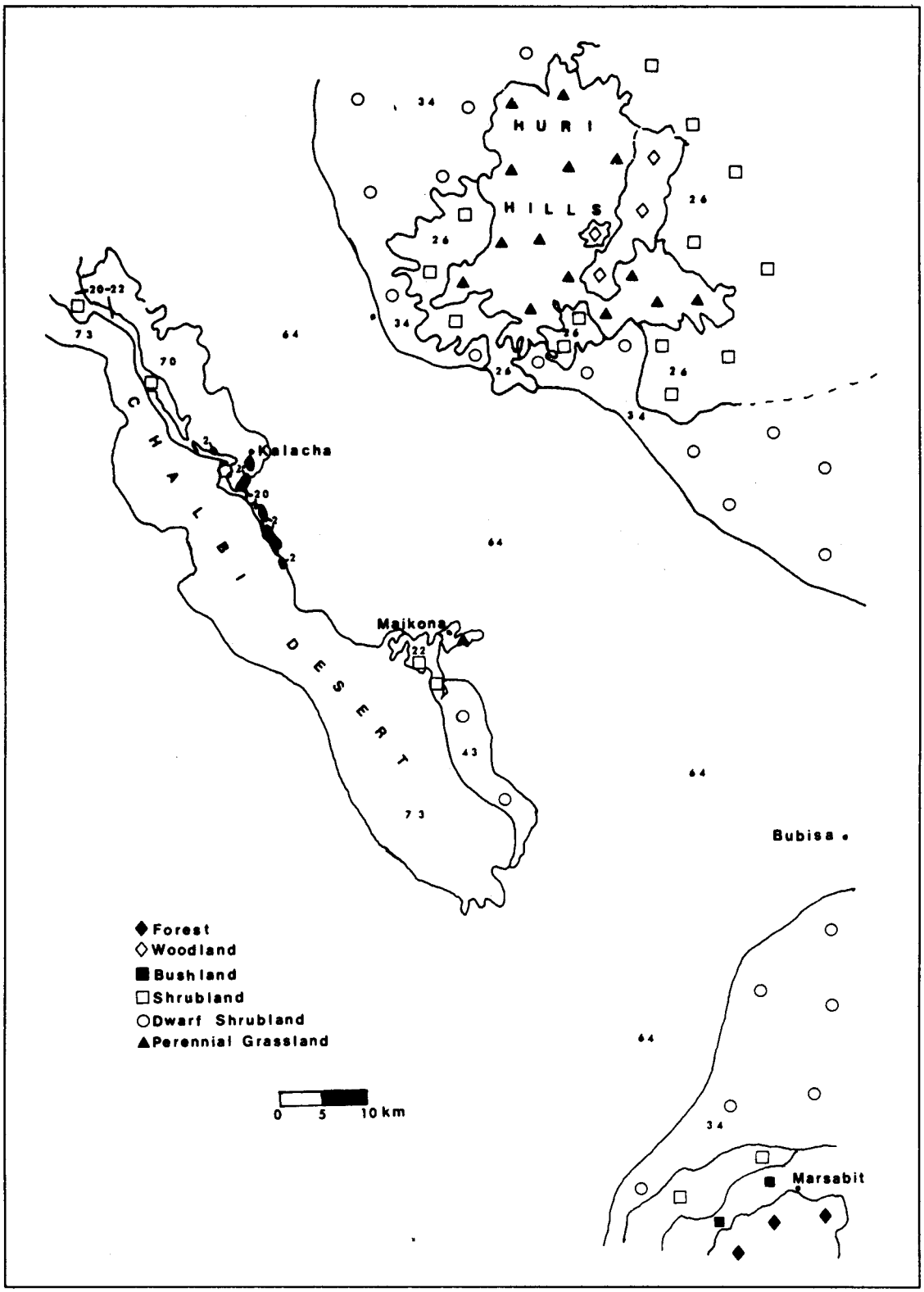

Figure 3. Distribution of tertiary vegetation types in the study area as defined by Herlocker (1979)

2. P12 - light coloured Lithosols and calcic Xerosols developed on limestone lacustrine sediments (eastern edge of Chalbi Desert).

3. F8 - imperfectly drained calcic Xerosols developed on colluvium from various volcanic rocks, in many places with a boulder mantle (in broad fingering zones leading up to the Hurri Hills away from the Chalbi Desert and following drainage lines to the north of Marsabit away from the highlands).

4. R14 - well drained Lithosols and calcic Xerosols with a rocky and bouldery surface, developed on olivine basalts and pyroclastic rocks (completely surrounding the Hurri Hills, the Chari Ashe, Mt. Kulal and Marsabit, descending in places to the Chalbi Desert).

The perennial grasslands are found on M7 souls, the annual grasslands (except for type 70) and the shrub and dwarf shrublands on F8 and R14 soils, and the *Aristida / Acacia tortilis* annual grassland (type 70) is found on the P12 soils. The Chalbi Desert itself is made up of poorly to very poorly drained, brown, saline Solonchak clays (P14 and 5 of Sombroek *et al.*, 1982).

Gabra environmental classification

The Gabra, like other Oromo, have a complex system of classifying environmental and geographic features, which not only serve to describe the physical landscape, but also to express cultural concepts. For the purpose of land-use analysis, however, the system can be greatly simplified and related to the vegetation and soil maps of the area (Herlocker, 1979; Sombroek *et al.*, 1982) to derive four land-use zones:-

I. *Chalbi** – mostly barrenland (73) with *Hyphaene* (2) oases along the eastern margin at the base of the volcanic plain (R14) and around North Horr; saline Solonchak soils (p14 and 5); 450–480 m average altitude.

II. *Basa* – evergreen shrubland (20 and 22) and wooded dwarf shrub; short annual grassland (70); calcareous lacustrine Lithosols and calcic Xerosols (P12); 500–600 m.

III. *Bule* – shrubland (26) on the higher part and lower down there is mainly bushed dwarf shrub annual grassland (64) and dwarf shrubland (34); either well or imperfectly drained Lithosols or calcic Xerosols derived from volcanic rocks, a lava cobble mantle common, sometimes a finer stony surface, punctuated by lava outcrops (F8 and R14); 600–1250 m.

IV. *Badda* – perennial grasslands (46, 48 and 51) and woodlands and shrublands (woodlands were not sampled in this study); rocky and stony Cambisols (M7) and reddish brown, eutric Nitisols (M3 of Sombroek *et al.*, 1982); 1250-1685 m.

Each of these zones can be defined in relation to a primary opposition recognized by all Oromo, between lowlands (*gammoojji*) and highlands (*badda*), so that zones I, II, and the lower parts of III occur in the former category and the higher levels of III and IV occur in the latter category.

* All Gabra terms used in this paper have been transcribed according to the system of notation used by Gragg (1982) except that for typographical convenience where he writes *s, n,* we use *sh, ny* to denote the same sound. When there is an existing convention of noting place names like chalbi, charri, etc., this has been retained. Q is transcribed *k*. The vernacular terms have been checked by Oromo speakers, but as there is no fixed system of writing, thus notation varies and it should not be seen as definitive.

Other geographic features distinguished by the Gabra are: *dida*, "plain", *c'albi* (*chalbi*), being a type of plain generally barren and characterized by its salty soil (*muludde*); *lafica*, an open, flat savanna area; *kurkura* an area of dense pebbles opposed to the *bule* which is formed of volcanic cobbles and boulders; *c'arri* (*charri*), a range of low-lying hills which occurs in the lowlands, *tulluu* (*tulu*), hills which occur in the highlands and *k'ubi*, hillocks which can occur anywhere. A mountain is *gaara*, and a crater *gofa*. Foothills are known as *sarba*, literally "calf" (of leg). *Golbo* is a type of trough; large expanses of water, like lakes and rivers are termed *galaana* and river valleys and dry river beds are called *laga*.

The Gabra are intimately aware of what each of these zones has to offer in the way of vegetation, water and soils and use this knowledge when planning their movement patterns. They measure the quality of pasture on the fluctuating scale of *finna* (fertility). This is a complex cultural notion which enters frequently into Gabra decisions on livestock herding strategies and some areas are known to be *koshee* (having *finna*) for certain stock types.

METHODS

Gabra pastoralists were requested to take plant samples in the area surrounding their settlement and return with them. Samples were collected in the vicinity of Kalacha, around four *olla* (nomadic camps) in the Arerite and Roba Gade areas, from various spots on the lava plateau (*bule*) and the lower parts of the Hurri Hills and from around Bubisa (Fig. 2).

Each Gabra informant was asked a series of questions about the human uses, if any, of each plant, which livestock animals fed on the plant and how important it was in the diet according to season, and the areas where the plant could be found. The Gabra name for each plant was also recorded. The questioning was undertaken in English through a Gabra secondary-school student acting as interpreter. Plant-use information was also obtained when conducting studies of material culture and ritual and during periods of participant observation of Gabra daily life.

The plant samples were put into a plant press and subsequently deposited at the East African Herbarium for identification. In analysing the results of four collection lists two major problems arose: (1) some plant samples given the same Gabra name by different informants received more than one species identification by the Herbarium, and (2) some plant samples given different names by the informants were identified as the same species by the Herbarium.

There are several possible explanations for these apparent anomalies: (1) a Gabra informant misidentified the plant, (2) the Herbarium misidentified the sample, (3) the authors made a mistake in record-keeping before depositing the plants at the Herbarium, (4) some plants receive different names by the Gabra during different stages of growth or in different localities, and (5) some plants of similar appearance receive the same Gabra name. These possibilities are not mutually exclusive.

The identifications posing problems, along with all the others, were checked against the vernacular names given in Dale and Greenway (1961) and Synott (1979), and in some cases Legesse's Herbarium list (1981). Where either or all of these authors agreed with one of our matching pairs of Gabra - Herbarium identifications, we chose that one to include in our list (Table 1). Possible alternative identifications are noted in parentheses in the column containing the Gabra names. The Gabra do recognize higher orders of classification which group related plants into families, where most of the problematic identifications were found.*

The principal problem families were (*h*) *ammeesaa* and *buuyyo*; (*h*) *ammeesaa* corresponds to Burseraceae and other Herbarium identifications and those in Dale and Greenway (1961) indicate that

* The reasons for these "confusions" from the botanical point of view may be explained by Gabra / Booran plant taxonomy. Field-work would suggest that when a plant "degenerates" (i.e. when it reproduces itself in a slightly modified form), it is given a different name.

there is some confusion in correctly identifying the various *Commiphora* species. The Gabra also include the trees *Terminalia polycarpa / spinosa* (Combretaceae) in (*h*) *ammeesaa*.

Much more confusion was found in the *d'umashoo* family, which corresponds to the Capparaceae. *Boscia, Cadaba* and *Maerua* plant samples were identified interchangeably as *deekuku, k'ad'u, k'alk'acca* and (*h*) *afuursaa* and could belong to almost any of the three genera.

Buuyyo is the term for grass and thus corresponds to the Poaceae (Gramineae). Considering that samples were usually taken during the dry season when grass consists of little more than dry tufts, it was not always possible to get full identifications.

The fact that multiple identifications (c.15%) occurred raises the question of the accuracy in single-collection studies. For this reason we feel that any ethno-botanical study needs to obtain two or more corroborating sample identifications to be considered valid. As not all of our samples meet that criterion, the list presented here should be considered provisional and subject to verification and possible revision.

Plant identification and use

There is always a question as to what is the best method to present a plant list. We have chosen alphabetical order by family because many of the users of this list will not be botanists, and for non-specialists it is the simplest method of reference. Hepper *et al.* (1981) chose to list the plants of Mt. Kulal, near our study area, by order of evolution and degree of relatedness of the families. The families were ordered and numbered. For those wishing information of this sort, the Hepper *et al.* numbers are reproduced here in the first column in Table 1. In general, the lower the number the more primitive the family, and the closer together the numbers the more closely related are the families. An alphabetical list of vernacular names is also appended.

Table 1: A list of Gabra plants and their uses: (abbreviations used).

Plant
T — Tree
Sh — Shrub
Dsh — Dwarf shrub
L — Liane
Tw — Twiner
Tc — Tendril climber
H — Herb
G — Grass

Food:
C — Camel food
Ca — Cattle food
G — Goat food
S — Sheep food

Uses
Co — Construction
F — Food
Fw — Firewood
M — Medicine
O — Cultural objects
R — Ritual
V — Veterinary use

Score
0 — Not eaten or used
* — No good data collected
+ — Minor importance
++ — Moderate importance
+++ — Very important

No.	Family, genus and species	Gabra name	Plant type	Animal					Human					
				C	Ca	G	S	V	M	F	Co	O	R	Fw
259	ACANTHACEAE													
	Barleria acanthoides Vahl	shiisha	D Sh	+++	0	+	+	0	*	0	0	0	+	0
	Barleria sp.	maadeeka		+	0	0	0	0	0	0	0	0	0	0
	Blepharis ciliaris (L.) B.L. Burtt *B. linariifolia* Pers.	baarataa	H	++	+	++	+	+	*	0	0	0	0	+
	Duosperma ermophilum (Milne-Redh.) Napper	saariima	D Sh	++	++	++	+	0	0	0	0	0	0	0
	Ecbolium revolutum (L.) C.B. Cl.	k'atte (*Lantana* sp.)	D Sh	+	0	+	+	0	0	0	0	0	0	0
	Ruellia patula Jacq.	d'ad'ale		+	+	+	+	0	0	0	0	0	0	0
	Indet.	lakud'e	Sh	+	+	+	+	0	0	0	0	0	0	0
313	AGAVACEAE													
	Dracaena ellenbeckiana Engl.	butte	T Sh	0	0	0	0	0	0	0	0	+	0	0
	Sansevieria robusta (N.E. Br.) Jake	algge	Sh	0	0	0	0	0	0	0	++	+	+	0
54	AIZOACEAE													
	Trianthema salsoides Fenzl.	k'ant'alaa	H	+	0	+	0	0	0	0	0	0	0	0
	Zaleya pentandra (L.) Jeffrey	laamisho	H	+	+	+	+	0	0	0	0	0	0	0
63	AMARANTHACEAE													
	Aerva javanica Schultes	muk-illeensa	H	0	0	0	0	0	+	0	0	0	0	0
	(*A. persica* (Burm. f.)) Merrill	sufki	H	0	0	0	0	0	0	0	0	+	0	0
	Digera muricata (L.) Mart.	gelgedaana	H	++	+	++	+	0	0	0	0	0	0	0
	Pupalia lappacea (L.) Juss. var. *velutina* (Moq.) Hook. f.	matt'anne (*Sericocomopsis* sp.)	H	+	0	+	0	0	0	0	0	+	0	0
	Sericocomopsis hildebrandtii Schinz	jiibeete (*Dasysphaera prostrata* (Gilg & Schinz)	H	++	0	++	+	0	+	0	0	0	0	+
205	ANACARDIACEAE													
	Rhus natalensia Krauss	dabobbesa	Sh	+	*	+	+	*	*	+	*	*	*	+
230	APOCYNACEAE													
	Acokanthera schimperi (A.DC.) Schweinf.	k'arraaru	T	0	0	0	0	0	+	0	0	0	0	0
	Adenium obesum (Forsk.) Roem. & Schult.	obbe	Sh	0	0	0	0	0	+	0	0	0	0	0
	Carissa edulis (Forsk.) Vahl	dagamsa	Sh/L	0	0	0	0	0	+	0	0	0	0	0
	ARISTOLOCHIACEAE													
	Aristolochia bracteolata Lam.	raafu	?	0	0	0	0	0	0	0	0	0	0	0
314	ARECACEAE (PALMAE)													
	Hyphaene compressa H. Wendle.	meetti	T	0	0	0	0	0	0	+	++	+	0	+

No.	Family, genus and species	Gabra name	Plant type	Animal					Human					
				C	Ca	G	S	V	M	F	Co	O	R	Fw
231	ASCLEPIADACEAE													
	Calotropis procera (Ait.) Ait. f.	k'obboo	Sh	0	0	0	0	0	+	0	0	0	0	0
	Caralluma speciosa (N.E. Br.) N.E. Br.	boorara	H	0	0	0	0	0	+	0	0	0	0	0
195	BALANITACEAE													
	Balanites aegyptiaca (L.) Del.	baddana (*B. orbicularis*)	T	+	0	0	0	0	0	+	0	+	+	0
249	BORAGINACEAE													
	Cordia sinensis Lam. Aschers (*C. gharaf* (Forsk.))	mad'eera	T/Sh	+	0	+	+	0	0	+	++	++	+++	++
	Heliotropium albohispidum Bak..	kokoomisha	H	++	+	+	+	+	+	0	0	0	0	0
	H. somalense Vatke													
	H. subulatum (DC.) Martelli	dubarraara	H	+	0	+	+	0	0	0	0	0	0	0
196	BURSERACEAE													
	Boswellia hildebrandtii Engl.	dakkara	T	+	0	+	+	0	0	0	0	0	+	+
	Commiphora cf. *africana* (A. Rich). Engl.	ammeesaa	T/Sh	+	0	+	+	+	0	0	+	++	0	+
	C. boiviniana Engl.	dakd'aa	T/Sh	+	*	+	*	0	0	+	0	+	0	+
	C. myrrha (Nees) Engl.	k'umbi (*C. ellenbeckii* Engl.)	T	0	0	0	0	+	++	0	0	0	++	+
	C. habessinica (O. Berg) Engl.	c'allankaa	T	+	*	+	*	*	*	+	*	+	*	*
	C. erythrea (Ehrenb.) Engl.	agarsu	T	+	0	+	+	0	0	0	0	+	0	+
	C. incisa Chiov.	waaraa	T/Sh	+	0	+	+	*	+	0	0	+	+	+
	Commiphora sp.	warab reeba	T/Sh	+	0	+	+	0	0	0	+	0	0	+
146	CAESALPINIACEAE													
	Delonix elata (L.) Gamble	sukellaa	T	+	0	0	0	0	0	0	0	++	0	+
36	CAPPARACEAE													
	Cadaba farinosa Forsk.	deekuku (*Maerua oblongifolia* (Forsk.) A. Rich.)	Sh	++	0	++	++	0	0	0	0	0	0	0
	C. mirabilis Gilg) *C. gillettii*) R.A. Graham	k'adu (*Boscia*?)	Sh	++	+	++	+	0	0	0	0	0	0	0
	Maerua angolensis DC.) *M. crassifolia* Forsk.	k'alk'acca (*Boscia coriacea* Pax)	T	+	*	*	*	*	*	*	+	*	*	*
	M. crassifolia Forsk.) *M. kaessneri* Gilg. Bened.)	d'umashoo	Sh	+	0	+	+	0	0	0	0	0	0	++

No.	Family, genus and species	Gabra name	Plant type	Animal					Human					
				C	Ca	G	S	V	M	F	Co	O	R	Fw
	Maerua sp.	(h) afuursaa (*Cadaba mirabilis*)	T/Sh	++	+	++	+	0	0	0	0	0	0	+
	Indet.	k'ork'odda	Sh	+	+	+	+	0	0	0	0	0	0	+
61	CHENOPODIACEAE													
	Fadenia zygophylloides Allen & Townsend	had'um (*Gyroptera gilletti* Bosch.)	H	++	0	+	+	0	0	0	0	0	0	0
	Suaeda monoica J.F. Gmel.	d'uurtee (*Salsola dendroides* Pallas)	T/Sh	+++	0	+	+	0	0	0	0	0	0	+
121	COMBRETACEAE													
	Combretum cf. *denhardtiorum* Engl. & Diels	c'anc'ali	Sh	+	0	+	+	0	0	0	0	+	0	+
	C. molle G. Don	rukeesa	T	+	0	+	+	0	0	0	0	0	0	+
	Terminalia spinosa Engl. *T. polycarpa* Engl. & Diels	k'orobo	T	+	0	+	+	0	0	0	0	0	0	+
280	COMMELINACEAE													
	Commelina latifolia A. Rich.	k'ayyu	H	+	++	+	++	0	0	0	0	0	0	0
238	COMPOSITAE													
	Aspilia mossambicensis (Oliv.) Wild.	(h) ada (*Vernonia wakefieldii* Oliv.)	H	+	0	+	0	0	+	0	0	0	0	0
251	CONVOLVULACEAE													
	Seddera hirsuta Hall. f.	gurbi	+	0	+	0	0	0	0	0	0	0	0	0
103	CUCURBITACEAE													
	Cucumis dipsaceus Spach	buratte	Tc	0	0	+	+	0	0	0	0	0	0	0
	C. prophetarum L.	baram-barro	Tc	+	+	++	+	0	0	0	0	0	0	0
	Kedrostis gijef (J.F. Gmel) C. Jeffrey	gaalle (*Cucumis* sp.)	Tc	++	0	++	+	0	0	+	0	0	++	0
	CUPRESSACEAE													
	Juniperus procera Endl.	arru	T	0	0	0	0	0	0	0	0	0	++	0
221	EBENACEAE													
	Diospyros abyssinica (Hiern) F. White	lookko	T	*	*	*	*	*	+	+	*	+	*	*
136	EUPHORBIACEAE													
	Croton somalensis Vatke & Pax	d'irri	Sh	+	+	+	+	+	*	*	*	*	*	*
	Euphorbia candelabrum Kotschy	addamma	T	0	0	0	0	+	0	0	0	0	0	0
	E. cuneata Vahl	(h) idaa	Sh	+	0	+	+	0	0	0	0	0	0	0
	E. tescorum Carter	harkeena	Sh	0	0	0	0	0	+	0	0	0	0	0

No.	Family, genus and species	Gabra name	Plant type	Animal					Human					
				C	Ca	G	S	V	M	F	Co	O	R	Fw
264	LAMIACEAE (LABIATAE)													
	Leucas pododiskos Bullock	jilbeete kurooftu	H	0	0	0	0	0	+	0	0	0	0	0
293	LILIACEAE													
	Asparagus africanus Lam.	ergamssa	Tc	0	0	0	0	0	0	0	0	++	0	0
	Asparagus sp.	okolle	Tc	0	0	0	0	0	0	0	0	+	0	0
132	MALVACEAE													
	Pavonia zeylanica (L.) Cav.	ilk'abata	H	+	0	+	0	0	0	0	0	0	0	0
23	MENISPERMACEAE													
	Cocculus pendulus (J.R. & G. Forst.) Diels	marmma	Tw	+	0	+	0	0	0	0	0	0	0	0
147	MIMOSACEAE													
	A. etbaica Schweinf.	(h) allak'abeessa	T	+	0	+	+	0	*	*	*	+	*	+
	A. goetzei Harms	burraa	T	+	0	+	+	0	+	0	0	0	0	+
	A. mellifera (Vahl) Benth.	sap'ans gurraaca	T/Sh	+	0	+	+	0	0	0	+	0	0	+
	A. nilotica var. *subalata* (L.) Del.	burk'uk'e	T/Sh	+	0	+	+	0	0	0	+	0	0	+
	A. nubica Benth.	waanga	Sh	+	0	+	+	0	+	0	0	0	0	+
	Acacia paolii Chiov.	c'aac'anne (*A. horrida*)	S	+	0	+	+	0	0	0	0	++	0	+
	Acacia reficiens Wawra ssp. *misera* (Vatke) Brenan	sigirso	T/Sh	++	0	++	+	0	0	0	+	+	+	++
	A. senegal (L.) Willd.	iddaad'o	T/Sh	+	0	++	+	0	0	0	+	0	0	+
	A. seyal Del. var. *fistula* (Schweinf.) Oliv.	waac'c'u	T	0	0	+	0	0	0	+	+	0	0	+
	A. tortilis (Forsk.) Hayne	d'addaca	T	++	0	++	+	0	0	+	+++	++	++	+++
167	MORACEAE													
	Ficus glumosa Del.	k'iltaa	T/Sh	0	0	0	0	0	0	*	0	0	0	0
83	NYCTAGINACEAE													
	Commicarpus helenae (J.A. Schultes) Meikle	araddo, k'oraatti gaala	H	+	0	+	0	+	0	0	0	0	0	0
182	OLEACEAE													
	Olea europaea L. var. *africana* (Mill.) P.S. Green	ejersa	T/Sh	0	0	0	0	0	0	0	0	+	++	+
253	OROBANCHACEAE													
	Cistanche tubulosa (Schenk.) Hook.f.	(h)armaac'a	H	0	0	0	0	0	+	0	0	0	0	0
148	PAPILIONACEAE													
	Abrus schimperi Bak. ssp. *africanus* (Vatke) Verdc.	wargidda	H	0	0	0	0	0	0	0	0	+	0	0
	Crotalaria cf. *dumosa* Franch.	(h)asura	H	+	+	+	+	0	0	0	0	0	0	0

No.	Family, genus and species	Gabra name	Plant type	Animal C	Ca	G	S	V	Human M	F	Co	O	R	Fw
	Erythrina rotundata-obovata (*E. melanacantha*) Harms) *E. burttii* Bak. f.)	waleena	T	0	0	0	0	0	0	0	0	+	0	+
	Indigofera coerulea Roxb. var. *occidentalis* Gillett & Ali	(h)asura harre (*Cassia italica*)	H	0	0	0	0	0	0	0	0	+	0	0
	I. coerulea Roxb.) *I. colutea* (Burm. f.) Merrill *I. cliffordiana* Gillett *I. insularis* Chiov. *I. spicata* Forsk.	agaggaro	H	++	+	++	++	0	0	0	0	0	0	0
	I. spinosa Forsk.	k'ilt'ip'p'e	Ds	++	+	++	++	0	0	+	0	0	0	0
	Ormocarpum trichocarpum (Taub). Engl.	buutiyye	Sh	0	0	+	+	0	0	0	0	0	0	+
	Rhynchosia minima (L.) DC.	uube	H/Tw	+	0	++	++	0	0	0	0	0	0	0
	Vatovaea psuedolablab (Harms) Gillett	gaabbe	Tw	+	0	+	+	0	0	+	0	+	0	0
	Vigna frutescens A. Rich.	c'iimp'a	H	+	+	+	+	*	0	+	0	0	0	0
101	PASSIFLORACEAE													
	Adenia venenata Forsk.	obbe	Tc	0	0	+	0	0	0	0	0	0	0	0
332	POACEAE (GRAMINEAE)													
	Aristida adscensionis L. *Aristida mutabilis* Trin. & Rupr.	buuyyo biila	G	++	+++	++	++	0	0	0	++	0	0	+
	Cenchrus ciliaris L.	diilaleesa	G	+	+	+	+	*	*	*	*	*	*	*
	C. pennisetiformis Steud.	k'onc'orro	G	+	+	++	++	0	0	0	0	0	0	0
	C. setigerus Vahl	buuyyo harre	G	+	+	+	+	0	0	0	0	0	0	0
	Chrysopogon plumulosus Hochst.	alala	G	+	++	+	++	0	*	*	*	*	*	*
	Dactyloctenium bogdanii S.M. Phillips	maa	G	+	++	+	++	0	0	0	0	0	0	+
	Digitaria velutina (Forsk.) P. Beauv.	biila	G	+	++	+	++	0	0	0	0	0	0	0
	Echinochloa haploclada (Stapf) Stapf	geedi	G	+	+	+	+	*	*	*	*	*	*	*
	Leptothrium *senegalense* (Kunth) Clayton	ilmmogora	G	+	+	+	+	0	0	0	0	0	0	0
	Panicum coloratum L.	laabbesa	G	+	++	+	+	*	*	*	*	*	*	*
	Paspalidium desertorum (A. Rich.) Stapf	c'iraa (*Cenchrus* sp. *Sporobolus helvolus*).	G	+	++	+	++	0	0	0	+	0	+	0
	Pennisetum mezianum Leeke	ogoona	G	+	+	+	+	*	*	*	*	*	*	*
	Sehima nervosum (Rottl.) Stapf	sokhorsitu	G	*	*	*	*	*	*	*	*	*	*	*

No.	Family, genus and species	Gabra name	Plant type	Animal					Human					
				C	Ca	G	S	V	M	F	Co	O	R	Fw
	Setaria verticillata (L.) P. Beauv.	hank'arre	G	+	+	+	+	*	*	*	+	*	*	*
	Sporobolus ioclados (Trin.) Nees	buuyyo fiinc'oo	G	+	++	+	++	0	0	0	0	0	0	0
	S. spicatus (Vahl) Kunth	harfuuk'a	G	+	+	+	+	0	0	0	0	0	0	+
	Themeda triandra Forsk.	buuyyo diimtu	G	+	+	+	+	*	*	*	*	*	*	*
	Indet.	saatu	G	+	++	+	++	0	0	+	0	0	0	0
190	RHAMNACEAE													
	Ziziphus abyssinica A. Rich.	k'urk'uura	T/Sh	+	0	+	*	0	0	+	+	+	0	+
	RUTACEAE													
	Zanthoxylum chalybeum (Engl.) Kokw.	gaddaa	T	*	*	*	*	*	+	+	0	0	0	0
180	SALVADORACEAE													
	Salvadora persica L.	aadde	T/Sh	+++	0	++	+	0	+	0	+	0	0	+
252	SCROPHULARIACEAE													
	Pseudosopubia hildebrandtii (Vatke) Engl.	k'ors nyaata	H	0	0	+	0	+	0	0	0	0	+	0
250	SOLANACEAE													
	Lycium europaeum L.	fursaa	Sh	+	0	+	+	0	0	0	+	+	0	+
	Solanum coagulans Forsk. (*S. dubium* Fres. (*S. coagulans* Forsk.)	(h)iddi, (h)iddi ree, hiddi arado (small version)	H	0	0	0	0	*	0	0	+	0	0	+
			H	+	0	+	0	+	0	0	0	0	0	0
130	STERCULIACEAE													
	Sterculia africana (Lour.) Fiori	k'ararri	T	0	0	0	0	0	0	0	0	++	0	+
128	TILIACEAE													
	Corchorus triocularis L.	luuftoole (*Farsetia stenoptera* Hochst.)	H	+	+	+	+	0	0	0	0	0	0	0
	Grewia tenax (Forsk.) Fiori	d'eeka	Sh	+	0	+	+	0	0	+	0	+	+	0
	G. trichocarpa A. Rich. *G. bicolor* Juss.	(h)arorressa	Sh	+	0	+	+	0	0	+	++	+	0	+
	G. villosa Willd.	ogomdi	S	+	0	+	+	0	0	+	0	+	0	+
	Triumfetta flavescens Hochst.	ic'iinni	S	+	0	+	+	0	0	0	0	0	0	0
	VIOLACEAE													
	Rinorea convallariiflora M. Brandt	fit'o	T	*	*	*	*	*	*	*	*	*	+	*
193	VITACEAE													
	Cyphostemma nierense (Th. Fr. jr.) Desc.	rorroddo	Tc	0	0	0	0	0	+	0	0	0	0	0
66	ZYGOPHYLLACEAE													
	Tribulus cistoides L.	mogorree	H	+	+	+	+	0	+	0	0	0	0	0

RESULTS

Livestock

The degree of importance of each plant as livestock forage is a subjective measure in this study based on the combined opinions of approximately a dozen informants. The importance of a plant in the diet of any particular animal is a function of its availability, i.e. its abundance, and of the dietary needs of the animals at any point in time. Due to the ever-changing nature of these variables, and the methodological problems involved in recording timed feeding observations, we feel that this method probably yields results as valid as timed feeding trials, with less chance of a bias due to local species availability in the area of the feeding trials. The data provided here are from samples collected within an area of approximately 2400 km^2 covering a variety of ecological zones.

The degree of importance of a plant to livestock diet as reported in Table 1 needs some qualification. It is not based entirely on what would be a measure of the weight dry matter ingested by the animal, as quantity is not always of the utmost importance to a pastoralist, particularly concerning the camel. for example, *d'uurtee* (*Suaeda monoica / Salsola dendroides*) is considered as a very important plant for camel health due to its high salt content, particularly during the dry season. *Kilt'ip'p'e*, (*Indigofera spinosa*), however, is rated as only moderately important. Measured in dry-matter weight, camels probably eat more *k'ilt'ip'p'e*, since it is more widespread and abundant than *d'uurtee*. This is certainly true during the rainy seasons. *D'uurtee* is more important, however, because of its food value, not quantity, and as such a pastoralist would be much more likely to plan his herding strategy at certain times to take into account the location of *d'uurtee* than he would of *k'ilt'ip'p'e*. This kind of analysis is another reason why we think that a qualitative evaluation of plants as forage has some usefulness. We also tried to make a distinction between "importance" and "liking" in our questioning of informants. For example, camels have a very strong liking for *mad'eera* (*Cordia sinensis*), but because it is not very abundant in the study area it does not form a very important part of the camel diet (Table 1).

Goats display the widest range in diet, eating 91 of the 140-150 plants listed (the number depends on how many alternative identifications might be valid). Camels come next with 88, followed by sheep with 78 and lastly by cattle with only 34. The seven grass species in Table 1, mentioned by informants but about which we had collected no first-hand information, can be added to the total number of plants eaten by each livestock type, as others have listed them (Pratt & Gwynne 1977; Field 1979 a & b; Sato 1980). Nothing can be said about their relative importance in the diet, however. This would bring the total number of species eaten to 98 for goats, 95 for camels, 85 for sheep and 41 for cattle.

Table 2 presents a summary of the plants considered by our informants as being either "very important" or "moderately important" in the diet of each stock species.

Table 2: The Very and Moderately important plants in the livestock diet in the eastern Chalbi Desert area.

Camels

Very important (+++):	Moderately important (++):
Barleria acanthoides	*Blepharis ciliairis / linariifolia*
Duosperma eremophilum	*Digera muricata*
Suaeda monoica (Salsola dendroides?)	*Sericocomopsis hildebrantii*
Salvadora persica	*Heliotropium albohispidum*
(Indigofera all species)	*Cadaba farinosa*
	C. gillètti
	Maerua sp.
	Fadenia zygophylloides
	Kedrostis gijef

Aristida adsecensionis / mutabilis
Indigofera (many species)
Acacia reficiens
A. tortilis

Cattle

Very important (+++):	Moderately important (++):
Aristida adscensionis / mutabilis	*Commelina latifolia*
	Cenchrus pennisetiformis
	Chrysopogon plumulosus
	Dactyloctenium bogdanii
	Digitaria velutina
	Paspalidium desertorum
	Sporobolus ioclados

Goats

Very important (+++):	Moderately important (++):
Indigofera (all species)	*Blepharis ciliaris / linariifolia*
	Duosperma eremophilum
	Digera muricata
	Sericocomopsis hildebrandtii
	Cadaba farinosa
	C. gillettii
	Maerua sp.
	Cucumis prophetarum
	Kedrostis gijef
	Cenchrus pennisetiformis
	Indigofera spinosa
	Indigofera (many species)
	Rhynchosia minima
	Salvadora persica
	Acacia reficiens
	A. paolii
	A. senegal
	A. tortilis

Sheep

Very important (+++):	Moderately important (++):
Indigofera (all species)	*Cadaba farinosa*
	Commelina sp.
	Aristida adscensionis / mutabilis
	Cenchrus pennisetiformis
	Chrysopogon plumulosus
	Dactyloctenium bogdanii
	Digitaria velutina
	Paspalidium desertorum
	Sporobolus sp.
	Indigofera (many species)
	Rhynchosia minima

Camels have the highest number of "very important" species with four: *shiisha* (*Barleria acanthoides*), called "food of the camel" by the Gabra, *saariima* (*Duosperma eremophilum*) *d'uurtee* (*Suaeda monoica / Salsola dendroides*), and *aadde* (*Salvadora persica*). The genus *Indigofera* can be added to this class by combining *agaggaro* (several *Indigofera* species) and *k'ilt'ip'p'e* (*I. spinosa*). Twenty species (14 Gabra taxa) were rated as "moderately important" in the camel diet.

Two species of plants, *Aristida adscensionis / mutabilis*, both known as *buuyyo biila* in Gabra, are the only ones rated "very important" for cattle by the informants. This was undoubtedly due to their widespread abundance in the study area. Seven species were identified as being of "moderate importance", only one of them (*Commelina* sp.) not a grass.

It is interesting to note that no plant was specifically identified as being "very important" in the diet of goats or sheep. However, as in the case with camels, the genus *Indigofera* could be included here by combining the two Gabra taxa of *agaggaro* and *k'ilt'ip'p'e*, each considered "moderately important." Goats had 23 (18 Gabra) species names as "moderately important" and sheep had 17 (12 Gabra) in that class.

These results accord well with studies conducted by A.C. Field (1978), C.R. Field (1979a & b) and Sato (1980) on livestock feeding habits in northern Kenya, though these authors did not work in exactly the same study area.

Little research was conducted in the area of traditional veterinary treatments, but eight plants were identified as being employed for this purpose, all of them of minor importance. *Barataa* (*Blepharis*) is burned and the ashes are spread over camel wounds: *kokoomisha* (*Heliotropium albohispidum*) leaves are chewed up and applied to a snake bite to reduce swelling; the resin (*aamp'e*) from (*h*) *ammeesaa* (*C. africana*) is mixed with milk and applied to camels to remove ticks when they are in highland areas; *k'umbi* (*Commiphora myrha /ellenbeckii*), the myrhh tree, yields a resin which has many uses. One use is as a ritual cure for anthrax and is practised by a few clans. The resin is chewed and then spat all around the animal enclosure; *aaddaama* (*Euphorbia candelabrum*) is used to cure a camel disease called *gaal malaa*. A traditional doctor (*c'iressa*) must prepare and administer the medicine; *araddo* (*Commicarpus helenae*) is chewed and spat into the nose of a calf as a decongestant; *k'ors nyaata* (*Pseudosopubia hildebrandtii*) leaves are chewed up and the saliva put into the animal's mouth to protect it from a curse by a *budaa* (person with the evil eye); and (*h*) *iddi araddo* (the small or young *Solanum coagulans*) is used to treat a throat swelling disease called *c'ilmale* by burning it and passing the smoke under the animal's throat.

We cannot attest to the efficacy of any of these treatments.

Human uses

The Gabra use more species of plants for firewood than for any other purpose, with over 40 recorded Gabra taxa, though many more are certainly used. The most important, and preferred, wood is that of *Acacia tortilis*, followed by *A. reficiens* and *Maerua crassifolia / kaessneri*. Wood from other *Acacia* and *Commiphora* species is also commonly utilized as firewood, the frequency depending on local abundance. *Salvadora persica* (*aadde*) is not supposed to be used as firewood for reasons of *aada* (tradition), but as wood becomes more scarce younger women are sometimes using it.

According to Gabra traditional beliefs, live wood should not be cut for use as firewood. In most cases this rule is adhered to, but in areas where dead wood is rare or absent, particularly on the lava plains (*bule*), branches from living trees and shrubs will be cut. The Gabra are very conservation minded in their use of wood in cooking fires. They use small amounts and usually pull unburned faggots away from the centre of the hearth for re-use later on. The grasses listed under firewood are those most commonly used as tinder.

In construction use, 18 Gabra taxa (21 species) have been recorded. The most important is *A. tortilis* (*d'addac'a*), the preferred thorn branch to make animal enclosures and the only one allowed for building the ritual *naabo* enclosure. Other *Acacia* species are also used in boma construction and *A. reficiens* (*sigirso*) shrub is most often used as the animal enclosure gate, replaced each year in a ceremony (*almado*). Since the Gabra build on average about 10 new animal enclosures a year for

camels and sheep / goats in the main family settlements (*olla*) and several more at the satellite camps (*fora*), the amount of woody vegetation consumed per year for this purpose is substantial. Live wood is almost always used; however, it serves a dual purpose as it is later used as firewood.

The traditional Gabra house (*mana*) is also heavily dependent on plant matter. The house, or tent as it is sometimes called, is made by placing skins, cloth, mats and sometimes grass over a domed frame made of bent poles. The house poles (*dediee, utubaa*) are made from *Cordia / sinensis* (*mad'eera*) or *Grewia bicolor / trichocarpa* (*h*) *arorresa* saplings. Wood for these poles is collected at certain ritually prescribed times of the year. The tops of houses are traditionally covered with thick grass-like mats made from *Sanseveria* (*algge*), the wild sisal, but because of the large amount of time needed to go to the Golbo / Charri Ashe areas to collect it, the difficulty in processing it and its reduced abundance, other materials such as scrap aluminium and plastic sheeting are now being used. Sometimes grass thatch made from *Aristida* or, less commonly, *Paspalidium / Cenchrus / Sporobolus* (*c'iira*) is used to cover open patches on the roof or to plug air holes in the walls. *Algge* and *c'iraa* are also used to make rope and twine which are used to tie intersecting house poles and interior partition sticks together.

Leaves of *Hyphaene compressa* (*meetti*), the doum palm, are important today for roofing of permanent wattle and daub housing, and the straight branches are sometimes employed in making the wattle frame and for bed poles. *Commiphora* wood is not very important in building, being mainly used in the construction of fences of ritual enclosures (*naabo d'eeda* and *gosse*).

In the manufacture of objects of material culture ten Gabra taxa (32 species) were recorded. The most common type of object was a container or vessel, of which the Gabra have a wide variety. No attempt will be made here to present a full description of Gabra material culture as this is still subject to further research. The six most important plants used were: *Cordia* (*mad'eera*), used to make a man's walking stick (*hororo*), sometimes the (*h*) *okkoo* stick (used to shake *Acacia* pods (*arbuu*) from trees and to construct and repair the fence of the animal enclosure) and other ritual sticks; *Commiphora* (*c'allankaa* and (*h*) *ammeesaa*) used to make stools (*kaara* and *barc'uma*), water and fresh milk containers (*soroora*), and as a toothbrush stick (*rigaa*); *Delonix elata* (*sukellaa*) has a soft wood used very often in carving to make camel bells (*kokke*), fat-storage containers (*dibbe*), *soroora* and a large wooden bead (*q'ilinto*) put around camel bulls' necks during the mating season to protect them against the evil eye; *Asparagus africanus* (*ergamsa*) roots are used to weave milk containers (*c'iic'oo*), camel milking containers (*gorfa*), small containers used by children for carrying milk or water when herding, and the base and rim of *soroora*. The roots of another *Asparagus* species (or perhaps the same?) which the Gabra call *okolle* are used to weave the large (c.20 litres) water-transport and storage container (*butte*), which one commonly sees at well sites in Gabra country. *Acacia paolii* (*c'aac'anne*) is used to make various containers, and *Sterculia africana* (*k'arrarri*) is used to make cleaning "cloths" (*sosso*) by shredding and then soaking the bark in fat.

The Gabra depend very little on wild plant foods. The 15 Gabra taxa (17 species) recorded were all rated by our informants as of "minimal importance". The outside of the nut of the doum palm (*k'one*) is one of the most common wild plant foods, usually eaten by children as snacks, although in times of famine they may be eaten in great quantities by everyone. Wild berries produced by *Cordia, Kedrostis, Ziziphus* and *Grewia*, amongst others, are also enjoyed by people. The root of *Vatovaea* is eaten raw, mainly for its moisture, and the seedless pods of *A. tortilis* are eaten as a famine food. The other plants in the list are usually used to make infusions from the leaves or roots. Not marked in the food category were gums and resins, commonly chewed by the Gabra, belonging mainly to various *Acacia* and *Commiphora* species.

Only 19 plants were recorded as being of medicinal use. Perhaps the Gabra do not depend as heavily as most East African peoples on herbal medicines (Kokwaro, 1976), but this list is incomplete. Investigations will have to be made with knowledgeable Gabra *c'iressa* and with *waata* (traditionally low caste hunter-gatherers), who are reputed to be very learned in the use of plant medicines, in order to discuss in detail Gabra medicinal plant use. Gabra medicine in any case seems to be based more on what one could call "faith healing", often performed by people who are known as specialists for a certain part of the body because of their clan membership. Certain clans are associated with certain

parts of the human body. Treatments often consist of ritualistic ceremonies which may or may not make use of plants; even when they do, the treatment may be no more than chewing *k'umbi* and spitting it on the afflicted person.

Plants are very important in Gabra ritual life, which itself permeates all aspects of socio-economic behaviour. Due to the complexity of explaining plant use in this domain, and the large amount of data which we have, this subject will form the basis of a separate article.

We also have the names for about 50 uncollected Gabra plants and their uses, which would add several species to each of the livestock- and human-use categories discussed above.

CONCLUSIONS

The Gabra have an intimate knowledge of plant types and distribution in their territory because their existence depends on it. Grass, herbs, shrubs and trees feed the livestock which supply the Gabra with milk, meal, blood, skins, a medium of exchange, a repository of wealth and the basis of their social organisation. Plants are therefore of most importance in terms of livestock forage, but they are also essential for use as fuel, in construction and in the manufacture of material culture objects, though with the introduction of metal and plastic items this latter use is beginning to diminish. Plants are of less importance in medicine and as human food, but they are deeply involved in Gabra ritual life.

Deforestation and land degradation from overpopulation and overstocking — desertification — is a very great threat to the future of the Gabra as nomadic pastoralists. Unless a lasting solution is found to the problem of desertification the Gabra will eventually not have the plants they need for survival.

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APPENDIX

Alphabetical list of Gabra plant names with their botanical equivalents. (Genus, species & family names)

A	
aadde	*Salvadora persica* L., SALVADORACEAE
addaama	*Euphorbia candelabrum* Kotschy, EUPHORBIACEAE
agaggaro*	*Indigofera coerulea* Roxb.; *I. colutea* (Burm. f.) Merrill; *I. cliffordiana* Gillett; *I. insularis* Chiov.; *I. spicata* Forsk., PAPILIONACEAE
agarsu	*Commiphora erythrea* (Ehrenb.) Engl., BURSERACEAE
alala (buuyyo alala)	*Chrysopogon plumulosus* Hochst., POACEAE (GRAMINEAE)
algge	*Sansevieria robusta* N.E. Br., AGAVACEAE
araddo	*Commicarpus helenae* (J.A. Schultes) Meikle, NYCTAGINACEAE
arru	*Juniperus procera* Endl., CUPRESSACEAE
B	
baddana	*Balanites aegyptiaca* (L.) Del.; *B. orbicularis* Sprague, BALANITACEAE
baram-barro*	*Cucumis prophetarum* L., CUCURBITACEAE
barataa	*Blepharis ciliaris* (L.) B.L. Burtt.; *B. linariifolia* Pers., ACANTHACEAE
boorara	*Caralluma speciosa* (N.E. Br.) N.E. Br ASCLEPIADACEAE
buratte	*Cucumis dipsaceus* Spach, CUCURBITACEAE
burk'uk'e	*Acacia nilotica* ssp. *subalata* (L.) Del., MIMOSACEAE
burraa	*Acacia goetzei* Harms, MIMOSACEAE
butte	*Dracaena ellenbeckiana* Engl., AGAVACEAE
buutiyye	*Ormocarpum trichocarpum* (Taub) Engl., PAPILIONACEAE
buuyyo**	
—biila	*Aristida adscensionis* L.; A. *mutabilis* Trin. & Rupr.; *Digitaria velutina*, POACEAE (GRAMINEAE)
—diimtu	*Themeda triandra* Forsk., POACEAE (GRAMINEAE)
—fiinc'oo	*Sporobolus ioclados* (Trin.) Nees, POACEAE (GRAMINEAE)
—harre	*Cenchrus setigerus* Vahl., POACEAE (GRAMINEAE)
C'	
c'aac'anne	*Acacia paolii* Chiov., *A. horrida* (L.) Willd., MIMOSACEAE
c'allankaa	*Commiphora habessinica* (O. Berg) Engl. BURSERACEAE
c'anc'ali	*Combretum* cf. *denhardtiorum* Engl. & Diels, COMBRETACEAE
c'imp'a	*Vigna frutescens* A. Rich, PAPILIONACEAE
c'iraa (buuyyo c'iraa)	*Paspalidium desertorum* (A. Rich.) Stapf; *Cenchrus* sp., *Sporobolus helvolus* (Trin.) Th. Dur. & Schinz, POACEAE (GRAMINEAE)
D	
dabobbesa	*Rhus natalensis* Krauss, ANACARDIACEAE
dagamsa	*Carissa edulis* (Forsk.) Vahl, APOCYNACEAE
dak(a)d'aa	*Commiphora boiviniana* Engl., BURSERACEAE
dakkara	*Boswellia hildebrandtii* Engl., BURSERACEAE
deekuku	*Cadaba farinosa* Forsk., *Maerua oblongifolia* (Forsk.) A. Rich., CAPPARACEAE
diilaleesa	*Cenchrus ciliaris* L., POACEAE (GRAMINEAE)
dubarraara	*Heliotropium somalense* Vatke, *H. subulatum* (DC.) Martelli, BORAGINACEAE
d'ad'ale	*Ruellia patula* Jacq., ACANTHACEAE
d'addaca	*Acacia tortilis* (Forsk.) Hayne, MIMOSACEAE
d'eekaa	*Grewia tenax* (Forsk.) Fiori, TILIACEAE

d'irri*	*Croton somalensis* (Vatke) Pax EUPHORBIACEAE
d'umashoo	*Maerua crassifolia* Forsk., *M. kaessneri* Gilg & Bened., CAPPARACEAE
d'uurtee	*Suaeda monoica* J.F. Gmel., CHENOPODIACEAE
E	
ejerssa	*Olea europea* L. ssp. *africana*, (Mill.) P.S. Green, OLEACEAE
ergamassa	*Asparagus africanus* Lam., LILIACEAE
F	
fit'o	*Rinorea convallariiflora* M. Brandt, VIOLACEAE
fursaa	*Lycium europaeum* L., SOLANACEAE
G	
gaabbe	*Vatovaea psuedolablab* (Harms) Gillett, PAPILIONACEAE
gaalle	*Kedrostis gijef* (J.F. Gmel.) C. Jeffrey, CUCURBITACEAE
gaddaa	*Zanthoxylum chalybeum* (Engl.) Engl., RUTACEAE
geeddi	*Echinochloa haploclada* (Stapf) Stapf., POACEAE (GRAMINEAE)
gelgedaana	*Digera muricata* (L.) Mart, AMARANTHACEAE
gurbi**	*Seddera hirsuta* Hall. f., CONVOLVULACEAE
H	
(h)addaa	*Aspilia mossambicensis* (Oliv.) Wild, *Vernonia wakefieldii* Oliv., COMPOSITAE
(h)ad'um	*Fadenia zygophylloides* Allen & Townsend, *Gyroptera gilletti* Botsch, CHENOPODIACEAE
(h)afuursaa	*Maerua* sp., *Cadaba mirabilis* Gilg, CAPPARACEAE
(h)allak'abeesa	*Acacia etbaica* Schweinf., MIMOSACEAE
(h)ammeesaa*	*Commiphora africana* (A. Rich.) Engl., BURSERACEAE
(h)ank'arre	*Setaria verticillata* (L.) P. Beauv., POACEAE (GRAMINEAE)
(h)arkeena	*Euphorbia tescorum* Carter, EUPHORBIACEAE
(h)arfuuk'a	*Sporobolus spicatus* (Vahl) Kunth, POACEAE (GRAMINEAE)
(h)armaac'a	*Cistanche tubulosa* (Schenk.) Hook. f., OROBANCHACEAE
(h)arorressa	*Grewia trichocarpa* A. Rich., *G. bicolor* Juss., TILIACEAE
(h)asura*	
—	*Crotalaria* cf. *dumosa* Franch, PAPILIONACEAE
—harre	*Indigofera coerulea* Roxb. var. *occidentalis* Gillett & Ali, PAPILIONACEAE
—	*Cassia italica* (Mill.) F.W. Andr., subsp. *micrantha* Brenan, CAESALPINIACEAE
(h)idaa	*Euphorbia cuneata* Vahl, EUPHORBIACEAE
(h)iddi*	
—loonni	*Solanum incanum* L., SOLANACEAE
—ree (aradab)	*S. coagulans* Forsk., SOLANACEAE
I	
ic'iinni	*Triumfetta flavescens* Hochst., TILIACEAE
id'd'aad'o	*Acacia senegal* (L.) Willd., MIMOSACEAE
ilk'abate	*Pavonia zeylanica* (L.) Cav., MALVACEAE
ilmmogora	*Leptrothrium senegalense* (Kunth), Clayton, POACEAE (GRAMINEAE)
J	
jilbeete	*Sericocomopsis hildebrandtii* Schinz, *Dasysphaera prostrata* (Gilg & Schinz) Caraco, AMARANTHACEAE
—kurroftu	*Leucas pododiskos* Bullock, LAMIACEAE
K	
kokoomisha	*Heliotropium albohispidum* Bak., BORAGINACEAE

K'

K'ad'u	*Cadaba mirabilis* Gilg, *C. gillettii* R.A. Graham; *Boscia* (?), CAPPARACEAE
k'alk'acca	*Maerua angolensis* DC., M. *crassifolia* Forsk.; *boscia coriacea* Pax, CAPPARACEAE
k'antallaa	*Trianthema salsoides* Fenzl., AIZOACEAE
k'arrarri	*Sterculia africana* (Lour.) Fiori, STERCULIACEAE
k'arrarru	*Acokanthera schimperi* (A.DC.) Schweinf., APOCYNACEAE
k'atte	*Ecbolium revolutum* (L.) C.B. Cl., ACANTHACEAE
k'ayyu	*Commelina latifolia* A. Rich., COMMELINACEAE
k'iltaa	*Ficus glumosa* Del., MORACEAE
k'iltip'p'e	*Indigofera spinosa* Forsk., PAPILIONACEAE
k'obbo	*Calotropis procera* (Ait.) Ait. f., ASCLEPIADACEAE
k'onc'orro	*Cenchrus pennisetiformis* Steud., POACEAE (GRAMINEAE)
k'oraatti gaala	*Commicarpus helenae* (J.A. Schultes) Meikle, NYCTAGINACEAE
k'ork'odda	Indet., CAPPARACEAE
k'orrobbo	*Terminalia spinosa* Engl., *T. polycarpa* Engl. & Diels, COMBRETACEAE
k'ors nyaata	*Pseudosopubia hildebrandtii* (Vatke) Engl., SCROPHULARIACEAE
k'umbi	*Commiphora coriacea* Engl., *C. ellenbeckii* Engl., BURSERACEAE
k'urk'uura	*Ziziphus abyssinica* A. Rich., RHAMNACEAE

L

laabbesa	*Panicum coloratum* L. POACEAE (GRAMINEAE)
laamisho	*Zaleya pentandra* (L.) Jeffrey, AIZOACEAE
lakud'e	Indet., ACANTHACEAE
lookko	*Diospyros abyssinica* (Hiern) F. White, EBENACEAE
luuftoole	*Corchorus trilocularis* L., TILIACEAE
	Farsetia stenoptera Hochst. CRUCIFERAE

M

maa	*Dactyloctenium bogdanii* S.M. Phillips, POACEAE (GRAMINEAE)
mad'eeka	*Barleria* sp., ACANTHACEAE
mad'eera	*Cordia sinensis* Lam., BORAGINACEAE
marmma	*Cocculus pendulus* (J. R. & G. Forst,) Diels, MENISPERMACEAE
mat't'anne	*Pupalia lappacea* (L.) Juss, *Sericocomopsis* sp. (?). AMARANTHACEAE
meetti	*Hyphaene compressa* Wendl., ARECACEAE
mogorre	*Tribulus cistoides* L., ZYGOPHYLLACEAE
mookofa	*Croton dichogamus* Pax, EUPHORBIACEAE
muk-illeensaa	*Aerva javanica* Schultes, AMARANTHACEAE

N

nyaap'p'o	*Croton megalocarpus* Hutch., EUPHORBIACEAE

O

obbe	*Adenium obesum* (Forsk.) Roem. & Schult., APOCYNACEAE
	Adenia venenata Forsk., PASSIFLORACEAE
ogomdi	*Grewia villosa* Willd., TILIACEAE
ogoono	*Pennisetum mezianum* Leeke, POACEAE (GRAMINEAE)
okolle	*Asparagus africanus* Lam., LILIACEAE

R

raafu***	*Aristolochia bracteolata* Lam., ARISTOLOCHIACEAE
rorroddo	*Cyphostemma nieriense* (Th. Fr. jr.) Desc., VITACEAE
rukeesa	*Combretum molle* G. Don, COMBRETACEAE

S

saariima	*Duosperma eremophilum* (Milne-Redh.) Napper, ACANTHACEAE
saatu	Indet., POACEAE (GRAMINEAE)
sap'ans gurraaca	*Acacia mellifera* (Vahl) Benth., MIMOSACEAE
sigirso	*Acacia reficiens, Wawra* ssp.. *misera* (Vatke) Brenan, MIMOSACEAE
sokorsitu	*Sehima nervosum* (Rottl.) Stapf., POACEAE (GRAMINEAE)
sukellaa	*Delonix elata* (L.) Gamble, *Caesalpiniaceae*
suufki	*Aerva javanica* Schultes, AMARANTHACEAE

SH

shiisha	*Barleria acanthoides* Vahl, ACANTHACEAE

U

uube	*Rhynchosia minima* (L.) DC., PAPILIONACEAE

W

waac'c'u	*Acacia seyal* Del. var. *fistula* (Schweinf.) Oliv., MIMOSACEAE
waaraa	*Commiphora incisa* Chiov., BURSERACEAE
waanga	*Acacia nubica* Benth., MIMOSACEAE
waleena	*Erythrina melanacantha* Harms, *E. burtii* Bak. f., *E. rotundata-obovata* Bak. f., PAPILIONACEAE
warab reeba	*Commiphora ellenbeckii* Engl., BURSERACEAE
warjidda	*Abrus schimperi* Bak. ssp. *africanus* (Vatke) Verdc., PAPILIONACEAE

* These are generics. The specific forms are labelled according to their use (liked by camel, goat etc.; incense; toothbrush, etc.), eco-zone (*badda, gammooji, bule*, etc.), sometimes by colour (given by the soil) or reproductive characteristic (male, female).

** *Buuyyo* is the general word for grass and gurbi means "bush" or "shrub". Both words sometimes form part of the name, followed by a qualifier.

*** *Raafu* is the general work for plants whose leaves are cooked and eaten like spinach. It applies to more than one species.

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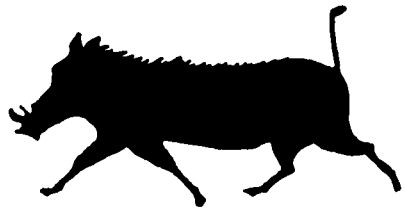

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