

ONE HUNDRED LOCAL FOOD PLANTS TO IMPROVE NUTRITION

Species botany, local knowledge, and nutritional qualities



FOREWORD

The information displayed in this book was gathered in the context of the work on Local Food Plants for Nutrition, implemented during the second phase of the Sowing Diversity = Harvesting Security (hereafter, SD=HS) programme (2019-2023). SD=HS is a global programme, currently implemented by Oxfam Country Offices and partners in eight countries, coordinated by Oxfam Novib, and funded by the Swedish Development Cooperation (Sida).

The overall objective of the SD=HS programme is to empower indigenous peoples and smallholder farmers to uphold, strengthen and mainstream their rights and build technical capacities to better manage agricultural biodiversity to achieve food and nutrition security in the context of climate change. Empowerment, experiential participatory learning, and action research are central elements of the programme.

Specifically, SD=HS's work on Local Food Plants for Nutrition aimed at strengthening the strategies that households employ to cope with food scarcity and malnutrition by increasing the intake of nutritious food based on local biodiversity. The work also aimed at improving the management of local food plants, particularly neglected and underutilized species (NUS). The programme's focus on species that have the potential to tackle main nutritional deficiencies and to help reduce the length and severity of the food scarcity season yielded the compilation of a set of hundred local food plants presented in this book.

SD=HS's work on Local Food Plants for Nutrition took place in Zimbabwe, Uganda, Zambia, Laos, Nepal, Peru, and Guatemala. The implementing partners in these countries were the *National Agricultural and Forestry Research Institute (NAFRI)* and the *Agricultural Research Center (ARC)* in Laos, the *Local Initiatives for Biodiversity, Research and Development (LI-BIRD)* in Nepal, the *Asociación de Organizaciones de los Cuchumatanes (ASOCUCH)* in Guatemala, the *Participatory Ecological Land Use Management (PELUM)* and the *Eastern and Southern Africa Small Scale Farmers' Forum (ESAFF)* in Uganda, the *Community Technology Development Trust (CTDT)* in Zambia and Zimbabwe, and the *Fomento de la Vida (FOVIDA)* in Peru. Without the contribution of each of these partners, the book would not have been possible.

We hope this book contributes to increased attention on the role of local food plants for healthy and affordable diets, and improved nutrition of indigenous peoples and smallholder farmers (IPSHF) in Africa, Asia, and Latin America.

Gisella Cruz-Garcia, Konstantina Maria Togka, Hilton Mbozi, and Bert Visser
The Netherlands, 2023



COLOPHON

One hundred local food plants to improve nutrition.
Species botany, local knowledge, and nutritional qualities.

First edition

This book was written by Gisella Cruz-Garcia, Konstantina Maria Togka, Hilton Mbozi, and Bert Visser. This work was part of the Sowing Diversity = Harvesting Security programme (www.sdhsprogram.org) Phase II (2019-2023). Funding for the programme was provided by the Swedish International Development Cooperation Agency (Sida).

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Email sdhsprogram@oxfamnovib.nl
Oxfam Novib, P.O. Box 30919, 2500 GX The Hague, The Netherlands.

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Carlos Zapparolli. Farmer Cletha Ramírez López sowing in Los Ramírez Aldea Chaluitz, Todos Santos Cuchumatanes, Guatemala.

WHY THIS BOOK

This book is about local food plants. We love local crop diversity as well as the diversity in wild food plants. Diversity is essential to maintain and improve global food and nutrition security in times of increasing effects of climate change. Diversity allows our crops and varieties and the wild food plants to adapt to local ecosystems and the occurring changes within these systems. Diversity allows us to improve diets so that malnutrition can be pushed back.

Crop diversity is also a local heritage and steeped in local culture. Wild food plants are closely associated with local ecosystems and their use depends on local knowledge. Crops and varieties as well as wild food plants that fit different agroecosystems are often used for different purposes and end up in different dishes, maintaining crop diversity and local food culture worldwide. But crop diversity is also threatened by the industrialization of agriculture and globalization of food systems. Across the world, farmers are losing crops and varieties and the knowledge to cultivate and use them. Local communities lose the knowledge about wild food plants in their environments.



Members of Golimori FFS in Adjumani district, Uganda harvesting Jiri

This book is not about the big crops that we all know and that are grown all over the world, it is not about wheat, rice, maize, and potato, not about bread-making, pizzas, French fries, and pre-boiled rice. It is not about the often heavily processed food items produced from these big crops that have become increasingly the same across the world. It is about all other crops and their varieties and about wild food plants that are threatened because of the globalization of our agriculture and our food patterns and the loss of our ecosystems. The local food plants described have not all been domesticated or only partly so, and some still occur only in the wild. In literature, these species are often called Neglected and Underutilized Species (NUS). But for the communities that grow and use them, they may not be neglected or underutilized at all. Some local food plants are indeed neglected and underutilized, but some are thriving in local culture.

This book is an attempt to display how much local crop diversity and knowledge about diversity in wild food plants is still in people's hands and minds, and how many practices are still known to the people who grow, collect, and use them. This book is also an attempt to raise your interest in local food plants. What we offer is just a sample and a snapshot, from a limited number of countries and communities. Local food plant diversity in the real world is much richer. It should be maintained, recovered, revalued, and used for the benefit of humankind. We invite you to take a look and we hope this book will help you to think about the local food plants in your own environment, your own farming systems. We hope for this book to become the best friend for those who are keen to improve their nutrition, and/or help others do so, through the use of local food plant biodiversity and the consumption of their products.

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LIST OF SPECIES

SORTED ALPHABETICALLY

A Abelmoschus esculentus	34	Cucurbita moschata	102	Psidium guajava	170
Adansonia digitata	36	D Dahlia imperialis	104	R Raphanus sativus	172
Allium schoenoprasum	38	Dioscorea alata	106	Rhoicissus tomentosa	174
Amaranthus caudatus	40	Dioscorea bulbifera	108	S Sechium edule	176
Amaranthus cruentus	42	Dioscorea deltoidea	110	Senna obtusifolia	178
Amaranthus hybridus	44	Dioscorea hirtiflora	112	Sesamum indicum	180
subsp. quitensis	46	Dioscorea villosa	114	Sesamum sesamoides	182
Amaranthus thunbergii	48	Diplazium esculentum	116	Setaria italica	184
Amaranthus tortuosus	50	Diploaxis muralis	118	Sinapis alba	186
Amaranthus viridis	52	E Eleusine coracana	120	Solanum aethiopicum	188
Avena sativa	54	Equisetum arvense	122	Solanum betaceum	190
B Basella alba	56	F Fagopyrum esculentum	124	Solanum nigrescens	192
Bidens pilosa	58	H Hibiscus sabdariffa	126	Solanum nigrum	194
Brassica carinata	60	I Ipomoea batatas	128	Sonchus oleraceus	196
C Cajanus cajan	62	L Lathyrus oleraceus	130	Strychnos madagascariensis	198
Canavalia gladiata	64	Lepidium sativum	132	Strychnos spinosa	200
Canna indica	66	Linum usitatissimum	134	Syzygium cordatum	202
Capsicum frutescens	68	Lupinus mutabilis	136	Tamarindus indica	204
Capsicum pubescens	70	M Manihot esculenta	138	T Taraxacum officinale	206
Centella asiatica	72	N Nasturtium officinale	140	Thespesia garckeana	208
Chenopodium album	74	O Ophioglossum californicum	142	Tropaeolum tuberosum	210
Chenopodium pallidicaule	76	Oxalis tuberosa	144	U Uapaca kirkiana	212
Chenopodium quinoa	78	P Pachyrhizus erosus	146	Ullucus tuberosus	214
Citrullus naudinianus	80	Passiflora edulis	148	Urtica dioica	216
Cleome gynandra	82	Passiflora pinnatistipula	150	V Vigna radiata	218
Cleome houtteana	84	Passiflora tripartita	152	Vigna subterranea	220
Colocasia esculenta	86	Pennisetum glaucum	154	Vigna umbellata	222
Corchorus olitorius	88	Perilla frutescens	156	Vigna unguiculata	224
Corchorus tridens	90	Phaseolus coccineus	158	Vitex doniana	226
Crotalaria longirostrata	92	Phyllogeiton discolor	160	X Xanthosoma sagittifolium	228
Crotalaria retusa	94	Physalis peruviana	162	Ximenia caffra	230
Cucumis anguria	96	Piliostigma malabaricum	164	Z Ziziphus mauritiana	232
Cucurbita ficifolia	98	Pinus roxburghii	166		
Cucurbita maxima	100	Prunus serotina subsp. capuli	168		

*Local food plants listed under a continent can also occur in other continents or even originate from other continents. Our listing per continent refers to how these species were reported from local communities in the implementing countries of the SD=HS programme.

SORTED BY CONTINENT

Africa

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Asia

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ACRONYMS

ASOCUCH	Asociación de Organizaciones de los Cuchumatanes
CTDT	Community Technology Development Trust
ESAFF	Eastern and Southern Africa Small Scale Farmers' Forum
FCTs	Food Composition Tables
FFS	Farmer Field School
FOVIDA	Fomento de la Vida
HDSD	Household Dietary Diversity Score
IPSHFs	Indigenous peoples and smallholder farmers
Li-Bird	Local Initiatives for Biodiversity, Research and Development
NAFRI	National Agricultural and Forestry Research Institute
NUS	Neglected and Underutilized Species
PELUM	Participatory Ecological Land Use Management
SD=HS	Sowing Diversity = Harvesting Security
ZAAB	Zambia Alliance for Agroecology and Biodiversity

GUA	Guatemala
LAO	Laos
NEP	Nepal
PER	Peru
UGA	Uganda
ZAM	Zambia
ZIM	Zimbabwe

LEGEND

	Raw/Fresh		Tuber
	Boiled/Blanched/Cooked		Leaves
	Roasted		Fruit
	Dried		Seed
	Pounded/ flour/ milled/grinded/powder		Stem
			Flower



Some of the FFS members of Golomori FFS during harvesting Osobi, in Adjumani district, Uganda

IMPROVING NUTRITION WITH **1** LOCAL FOOD PLANTS

Malnutrition is the leading cause of death and ill health worldwide, and in particular in developing countries. At the same time, multiple experiences from around the world have documented how Indigenous Peoples and Small-Holder Farmers (IPSHFs) ensure their food and nutrition security by using edible plants growing in their surroundings.

Several local food plants, in particular, neglected and under-utilized species (NUS), are very rich in particular nutrients that might be largely absent from the staple crops in the diet, most notably cereals and legumes. Plant biodiversity certainly holds a major key to addressing malnutrition, while helping to reduce food scarcity. However, it is often poorly recognized that a portfolio of local food plants is (potentially) available for the community diet to diversify the food and nutrient sources of the family.

The objective of this book is to describe the botany, local knowledge, and nutritional qualities of one hundred local food plant species that can help reduce the length of the food scarcity period and micronutrient deficiencies of IPSHFs. The list of a hundred local food plants was built based on the information provided by IPSHFs in the regions of Zimbabwe, Uganda, Zambia, Laos, Nepal, Peru, and Guatemala where the SD=HS programme was implemented. Not only species that were very popular among farmers were included, but also less popular species which might nevertheless play a key role during food scarcity periods. The latter focus is particularly important to rescue and highlight knowledge that may be in the process of getting lost.

This chapter starts with an explanation of malnutrition, followed by a discussion on the role of local food plants in tackling it, and continues with a description of the IPSHFs in the regions where the programme was implemented. The second chapter explains the variables that were described for each plant species. The third chapter presents the botanical, ethnobotanical, and nutritional

descriptions of each one of the hundred local food plants. This book ends with some reflections and recommendations, acknowledgments, a list of references, and an appendix with a detailed methodology.

1.1 MALNUTRITION AROUND THE WORLD

The term “malnutrition” refers to deficiencies, excesses, or imbalances in a person’s intake of energy and/or nutrients. More specifically, it addresses two broad groups of conditions: undernutrition and over-nutrition (WHO, 2021).

Despite globally set goals to address the problems of malnutrition, in 2020 the Global Nutrition Report revealed that malnutrition persists at unacceptably high levels across the world. According to the report, one in every nine people in the world was hungry, and one in every three was overweight or obese. Moreover, almost a quarter of all children under five years of age appeared stunted (GNR, 2020).

Malnutrition is a leading cause of death and disease worldwide, and a major impediment to public health and economic development (Saunders & Smith, 2010). The prevalence of underweight adults has substantially decreased over the past four decades, as the world is increasingly experiencing an obesity epidemic. Underweight continues to concern specifically the low- and lower-middle-income adult population in Sub-Saharan Africa and South Asia (Di Cesare et al., 2016). More specifically, in 2014, 9.7% of women and 8.8% of men worldwide were still underweight. Although any individual can experience malnutrition, children are at greatest risk, not only because of lower dietary intake but also because of their higher physiological requirements (Corkins et al., 2016).

Three forms of child undernutrition were distinguished, i.e., wasting (low weight-for-height), stunting (low height-for-age), and underweight (low weight-for-age) (Kelly, 2006). Among children under five years of age, 149.0 million (21.9%) appeared stunted, and 49.5 million (7.3%) were wasted. Since then, the number of underweight children and adolescents aged 5 to 19 years has decreased globally, from 37% in 2000 to 31.6% in 2016 among boys, and from 29.6% in 2000 to 25.9% in 2016 among girls. When examining potential inequalities based on countries’ income, the prevalence of childhood and adolescent underweight is on average up to three times higher in low- and lower-middle-income countries when compared with upper-middle- and high-income countries (GNR, 2020).

IN 2020 THE GLOBAL NUTRITION REPORT REVEALED THAT MALNUTRITION PERSISTS AT UNACCEPTABLY HIGH LEVELS ACROSS THE WORLD

PLANT BIODIVERSITY CERTAINLY HOLDS A MAJOR KEY TO ADDRESSING MALNUTRITION, WHILE HELPING TO REDUCE FOOD SCARCITY

MICRONUTRIENT DEFICIENCIES

Globally, an estimated one-third of people suffer from at least one form of micronutrient deficiency (FAO, IFAD, UNICEF, 2020), with Southeast Asia and sub-Saharan Africa experiencing the highest prevalence (Muthayya et al., 2013). The most common micronutrient deficiencies involve iron, zinc, vitamin A, iodine, and folate, but deficiencies of vitamin B12 and other B vitamins are also prevalent (Muthayya et al., 2013). Table 1 presents the most common micronutrient deficiencies together with a description of their worldwide prevalence.

Non-communicable diseases now account for more than one-half of the global burden of disease (Benziger et al., 2016) and cause more than 9 million annual deaths in people under the age of 60. According to current research, more than 80% of heart diseases, stroke, hypertension, and type 2 diabetes, and over a third of cancers can be prevented by eradicating the common risk factors, such as unhealthy diets (Kassa & Grace, 2019).

Malnutrition, and micronutrient deficiencies, in particular, are prevalent in the countries where the SD=HS work took place. Stunting and wasting are the most prevalent forms of malnutrition in our implementing countries, with Guatemala having one of the highest stunting rates in the world (Guatemala nutrition profile, 2015). Meanwhile, iron and vitamin A deficiencies affect the population in all of our implementing countries, with anemia affecting 19% of women of reproductive age in Peru (IFPRI, 2015). Vitamin A deficiency also affects a third of children under the age of 5 in Laos, and it is one of the most common micronutrient deficiencies in Zambia and Uganda (FANTA et al., 2014; Kikafunda, 2010; Mukuka & Mofu, 2016). Iodine deficiency is prevalent in six out of our seven implementing countries and affects around 24% of the population in Nepal. Nepal has also a high prevalence of other micronutrient deficiencies, such as B2, B6, vitamin D, vitamin E, and selenium (Bhandari & Banjara, 2015). Seasonal niacin (B3) deficiency and cases of pellagra have been reported in Zimbabwe, especially during severe droughts (Gadaga et al., 2009).

Table 1. Most common micronutrient deficiencies and their worldwide prevalence

Nutrient	Description	Prevalence Worldwide
Iron	Iron is an important element that the body requires for the synthesis of its oxygen transport proteins and for the formation of iron-containing enzymes (McDowell, 2003). Anemia, low levels of healthy red blood cells, is the most common implication of iron deficiency (Kędziora-Kornatowska et al., 2022).	Anemia affects 33% of the world's population, and about half of the cases are due to iron deficiency (Pasricha et al., 2021).
Vitamin A	Vitamin A is a fat-soluble vitamin essential in cell development, metabolism, immune competency, vision, and reproductive functions (Wiseman et al., 2017). Deficiency can lead to night blindness (Gilbert, 2013; Saari, 2016).	Although vitamin A deficiency and its mortality declined significantly over the past decade worldwide, it remains prevalent in South Asia and sub-Saharan Africa (Stevens et al., 2015).
Zinc	Zinc is an essential micronutrient for humans (McClung, 2019). Zinc deficiency may lead to growth impairment, sexual dysfunction, inflammation, gastrointestinal symptoms, or cutaneous effects (Sanna et al., 2018).	It is estimated that up to 17% of the global population is at risk for inadequate zinc intake, while in South Asia, up to 30% of the population may be deficient. Other areas at risk include sub-Saharan Africa and Central America (Skalny et al., 2021).
Iodine	Iodine is an important micronutrient that is required for the synthesis of the thyroid hormones thyroxine (T4) and triiodothyronine (T3) (Knust & Leung, 2016). Potential consequences of iodine deficiency are goiter, hypothyroidism, cretinism, and impaired cognitive development (Niwattisaiwong et al., 2017).	Approximately 2 billion people suffer from iodine deficiency (ID) of which approximately 50 million show clinical manifestations (Lazarus, 2015). Globally 241 million school-age children are estimated to have insufficient iodine intakes (Andersson et al., 2012).
Folate	Folate is an essential water-soluble vitamin, naturally present in food. Lack of this vitamin can lead to macrocytic anemia and a number of pregnancy-related complications (Khan & Jialal, 2021).	Among women of reproductive age, the prevalence of folate deficiency is higher than 20% in many low- and middle-income countries (Rogers et al., 2018). Existing folic acid food fortification programmes have reduced significantly the number of pregnancies affected by neural tube defects and the associated morbidity and mortality (Crider et al., 2011).

GLOBALLY, AN ESTIMATED ONE-THIRD OF PEOPLE SUFFER FROM AT LEAST ONE FORM OF MICRONUTRIENT DEFICIENCY

NUTRITION DURING FOOD SCARCITY

Food security comprises four elements: availability, access, utilization, and stability (FAO, 2008). Availability refers to the supply side of food (to have sufficient volumes of food produced); access refers to having physical access to food (e.g. land entitlements or sufficient economic means to buy food); utilization addresses if the food consumed covers the necessary nutritional requirements for a healthy life; and stability implies that the availability, access and adequate utilization of food is ensured throughout the years. However, for many people, the availability of food is driven by seasonal cycles, and access to food is worsening particularly in the pre-harvest months. During such food scarcity periods, household food stocks from the last harvest have begun to dwindle. This may also be reflected in food shortages within the local market, meaning that the food that is still available is sold at inflated prices.

27.6% OUT OF 2200 HOUSEHOLDS INDICATED THAT THEY SUFFERED FROM SEVERE OR MODERATE FOOD SCARCITY DURING THE FOOD SCARCITY PERIOD OF 2021

Food scarcity periods are a major feature in the countries where the SD=HS programme was implemented, where 27.6% out of 2200 households indicated that they suffered from severe or moderate food scarcity during the food scarcity period of 2021. During food scarcity periods the nutrition security of the family is at stake. Rural households are forced to resort to a number of coping strategies to deal with food scarcity, such as reducing the diversity and quantity or number of their meals, which may result in macro- and micronutrient deficiencies. Other strategies such as mortgaging or selling the land and other household assets result in further spiraling into poverty. The psychological effects of these challenges are intense, and all family members often experience high levels of anxiety and stress during this period. Women are especially affected, as their responsibilities often comprise food production, income-generating activities, and care for other household members (including food preparation). The challenges experienced at specific periods of the year generate seasonal patterns of hunger and undernutrition, which can nowadays be aggravated by climate change. However, seasonal hunger tends to be overlooked by statistics and policymakers, and may only get attention during natural or human-made calamities. Increasing the availability and access to nutritious local food plants, particularly during periods of food scarcity, is a key SD=HS approach to ensure the food and nutrition security of IPSHFs.

1.2 WHY LOCAL FOOD PLANTS?

What are local food plants?

Local food plants are all plants known and/or used by local communities as food. Local food plants include a wide range of species, ranging from domesticated (staples and minor crops) to semi-domesticated species and wild food plants. Local food plants not only grow in agricultural fields (where they can grow e.g. as crops or weeds) but also in multiple environments such as home gardens, roadsides, aquatic ecosystems, and forests. The diversity of local food plants plays a key role in diversifying the diet and the consumption of a wide array of nutrients for rural households. The knowledge of local food plants is held by IPSHFs and is largely related to the biodiversity of their surrounding environments. NUS are a key component of local food plants.

Local food plants are an important component of agrobiodiversity or agricultural biodiversity. Agrobiodiversity is a broader concept, which not only includes local food plants and animals consumed as food but also non-harvested species in the farming systems and surrounding environments that support the production of food (e.g. soil microbiota and pollinators) (Aarnink et al., 1999).

Definition of neglected and underutilized species (NUS)

From approximately 30,000 edible plant species that have been identified by humankind over time, and more than 7,000 that have been consumed as food during the history of humanity, nowadays only 30 crops account for 95% of human food energy intake, four of which (rice, wheat, maize, and potato) cover 60% of our caloric needs (Santos et al., 2023). However, our global plant kingdoms host plenty of other edible plant species, with a high potential to diversify our diets, address main nutritional requirements and shortcomings, mitigate risks in agricultural production, and provide rural households with additional income from the commercialization of the NUS at their disposal, while strengthening the cultural identity of the producers. In particular, NUS have been defined as useful plant species that consist of a large group of domesticated, semi-domesticated, and wild edible species, which are “marginalized, if not entirely ignored by researchers, breeders, and policymakers” (Padulosi et al., 2013).

THE DIVERSITY OF LOCAL FOOD PLANTS PLAYS A KEY ROLE IN DIVERSIFYING THE DIET AND THE CONSUMPTION OF A WIDE ARRAY OF NUTRIENTS FOR RURAL HOUSEHOLDS

LOCAL CULTURE DETERMINES THE DIET, AND THE LOCAL DIET IS AMENABLE TO CHANGE

Local culture determines the diet, and the local diet is amenable to change. So, as a consequence, any indication of NUS is place- and time-bound. What is considered a NUS now, can be a commercial food crop in the future. Crops such as rucola and quinoa have gone through these stages. A currently or recently common crop can lose the interest of its growers and users, and over time become a NUS, as happened to many local vegetables worldwide.

The concept of NUS is also culturally defined as it originates from the global scientific community. Local farmers and FFS participants may have difficulties in grasping the meaning of the term or in grouping certain crops and plants under NUS, primarily since some of these (domesticated) crops and (wild) plant species do play a recognized role in their farmlands and food systems. What is a NUS to the scientific community may not be a NUS in certain rural communities, and what is foreign and therefore underutilized in some communities may be major crops at the global level. To escape from this complex situation, we do include all plants that play an additional and often minor role in local agriculture and food systems as part of the SD=HS work on Nutrition and Local Food Plants.

Three groups of actors play a role in the neglect and underutilization of NUS: scientists and policymakers, the private sector, and local farmers. For example, a local type of legume that is widely cultivated in specific communities but is uncommon in other parts of the region and the country is apparently not neglected by all local farmers but may be neglected by policymakers. Small grain cereals (e.g. pearl millet and sorghum) are not neglected by local farmers in the drier zones of Zimbabwe but may be neglected by urban markets. In this context, it is important to distinguish between different types and levels of markets, i.e. the local, national, and global markets. Some NUS are present in local markets, very few may occur in national markets, whereas none are key commodities in global markets.

A gendered approach

It is important to take a gendered approach particularly because women play a key role in safeguarding the nutrition of their families. Secondly, gender relations and conditions determine the access, knowledge, values, use, and management related to plant genetic resources. In particular, mainly women keep the knowledge to locate, identify, and process wild food plants as well as to grow minor crops, including some vegetables and fruits. Therefore, the selection of a hundred food plant species for this book took into account the knowledge of both men and women.

1.3 PROGRAMME SITES WHERE LOCAL FOOD PLANTS WERE IDENTIFIED

Local food plants were identified in the seven countries where our work takes place. Table 2 presents the specific regions in these countries, where data were collected from. More specifically, our work focused on rural farming communities. Appendix 1 explains in detail the methodology used for data collection, analysis, and species selection.

Table 2. Regions where information on local food plants was obtained

Countries	Regions	Ethnic groups
Zambia	Lusaka, Central, Northern	Tonga, Shona, Sala, Nyanja, Lozi, Lenje, Luvale, Bemba, Ila, Kaonde
Zimbabwe	Masvingo, Mashonaland East, Mashonaland Central, Matabeleland North	Shona, Ndebele
Uganda	Northern, Eastern	Acholi, Alur, Aringa, Iteso, Kakwa, Lugbara, Luo, Madi
Guatemala	Huehuetenango (North-western)	Mam, Mestizo, Popti', Q'anjob'al
Peru	Juaja (Junín), Tayacaja (Huancavelica), Acobamba (Huancavelica)	Quecha
Nepal	Sudurpaschim	Indigenous, Dalit, Brahmin, Chhetri
Laos	Sainyabuli (North-western)	Lao Teung, Prai

UNDERSTANDING 2 LOCAL FOOD PLANTS

This book has an ethnobotanical approach, where ethnobotany is ‘the scientific discipline that studies the dynamic relationships between people and plants’ (Cruz-García, 2014) highlighting local knowledge and priorities. This approach was taken to select a set of hundred local food plants that are culturally and environmentally relevant for IPSHFs.

The species in this book are characterized botanically, ethnobotanically, and nutritionally. They were selected based on household surveys that were conducted in the regions where the SD=HS programme was implemented. In particular, species were selected based on the knowledge participants had about them, and their role in local diets, either due to their nutritional content or due to their availability and importance during the food scarcity periods. Furthermore, species reported from more than one country were prioritized, while major crops and staples were left out. Species that only played a role in ceremonies or were only locally used as condiments have also been excluded. Appendix 1 explains in detail the methodology used for the species selection, their analysis, and characterization. This chapter explains the variables that describe the species presented in Chapter 3 of this book.

2.1 PLANT NAMES

Local name: The local name presents the names provided by local informants, spelled in their own language, and written in their own alphabet. When multiple countries selected the same species, the local name provided by each country was included.

Transliterated name: This aims at producing a phonetic transliteration of local names provided in Lao and Nepali into English.

Scientific name: Botanical names follow from the taxonomy in the plant list of Kew Science’s Plants of the World Online (POWO, 2023).

English name: They were sourced from local partner organizations and verified by scientific consultants.

2.2 BOTANICAL INFORMATION

Growth form refers to the appearance of the species (herb, terrestrial herb, shrub, tree, climber, etc.).

Life cycle distinguishes mainly between annual and perennial species, although some domesticated species can be defined as being biennial.

Centre of origin indicates where domestication of a food plant took place, or in the case of a wild species how it is distributed over the globe.

Stress tolerance refers to mechanisms responsible for coping with an ongoing state of stress in plant cells, such as the synthesis of compatible substances and proteins, which protect against the negative effects of drought conditions.

Pictures and maps of geographical occurrence were sourced from the Global Biodiversity Information Facility (GBIF). The maps in the species descriptions depict the locations with latitude and longitude from which occurrence of the species has been reported, including both in situ sites such as farmlands and wild habitats, and ex situ facilities such as botanical gardens, herbariums, and gene banks. In other words, the dots in the maps include but do not only show locations where the species occurs in situ and on-farm, and do not only show the centre of origin of the species.

2.3 ETHNOBOTANICAL INFORMATION

This section contains information on the use and cultivation of the species, including the specific ethnobotanical knowledge reported in the countries and regions where the SD=HS project was implemented. When multiple countries highlighted the same species, the ethnobotanical information of each country was included.

Occurring in farming systems in indicates the farming systems and countries from where this species was reported as a major local food plant. The same species might also serve as food in other countries where its role in farming systems and food culture might be very different.

Level of domestication indicates whether a species was domesticated or not (still only available from the wild), and to which extent domestication of the plant to farming conditions has advanced.

Considered a NUS indicates if local communities regard this plant as neglected and/or underutilized.

Edible parts refers to which plant parts are eaten, and how (fresh or processed), and distinguishes between seed, leaves, flowers, stems, and underground parts (roots, rhizomes, tubers).

Contribution to food groups refers to a classification of food plants in five out of the twelve food groups of the Household Dietary Diversity Score (HDDS) depending on the part of the food plant that is usually consumed (FAO, 2010). These food groups are Cereals; White tubers and roots; Vegetables; Fruits; Legumes, nuts, and seeds.

Popular ways of preparation or preservation refers to the ways in which the harvested and used parts are prepared for consumption or kept for preservation and later use.

Growth place refers to where the plant species is being grown (when planted) or where it can be found (wild species).

Commercialization refers to the question of whether and to which extent a particular local food (plant or plant product) is offered and sold in markets, whether local, national, or even international.

2.4 NUTRITIONAL INFORMATION

Information is presented per 100g of each edible part for each food plant, when available from the literature. Information is offered according to the way of preparation. Both the types of edible plant parts and ways of preparation affect the nutritional composition of food products obtained from the specific plants. Values are presented for energy (kcal), water content (g), ash (g), seven macronutrients, and 27 micronutrients, as detailed in Table 3.

Table 3. *Macronutrients and micronutrients described in this book*

MACRONUTRIENTS	MICRONUTRIENTS	
	Vitamins	Minerals
Protein (g)	Thiamine (mg)	Calcium (mg)
Carbohydrates (g)	Riboflavin (mg)	Magnesium (mg)
Fiber (g)	Niacin (mg NE)	Zinc (mg)
Sugar (g)	Vitamin B6 (mg)	Iron (mg)
Fat total (g)	Pantothenate (mg)	Iodine (mcg)
Fat saturated (g)	Biotine (mcg)	Selenium (mcg)
Fat trans (g)	Vitamin B12 (mcg)	Copper (mg)
	Folate (mcg)	Manganese (mg)
	Vitamin C (mg)	Sodium (mg)
	Vitamin A (mcg RAE)	Potassium (mg)
	Vitamin D (mcg)	Cobalt (mcg)
	Vitamin E (mg)	Sulphur (mg)
	Vitamin K (mcg)	Chromium (mcg)
		Phosphorus (mg)

*Fat trans is a type of unsaturated fat that occurs in processed foods;
NE: 1 milligram of niacin or 60 mg of tryptophan; RAE: Retinol Activity Equivalents

This section also indicates nutrient claims for a plant (specifying the edible part and/or way of preparation) being the source of a particular nutrient, or as having a high content of this nutrient, based on the thresholds presented in Table 4. When a plant is a source of a specific component, it is indicated with a light green dot next to the value in the table, and in nutritional highlights. When a plant has a high content of such a component, this is indicated with a darker green dot.

Table 4. *Macronutrients and micronutrients described in this book*

Components	Claim	Claim Thresholds
Protein	Source	≥10% of NRV per 100 g <20% of NRV per 100 g
	High	≥20% of NRV per 100 g
Vitamins & Minerals	Source	≥15% of NRV per 100 g <30% of NRV per 100 g
	High	≥30% of NRV per 100 g
Fiber	Source	≥3 g per 100 g <6 g per 100 g
	High	≥6 g per 100 g

* NRV refers to the Nutrient Reference Values-Requirements of WHO and indicates the daily amount of nutrients (energy, macro-nutrients, vitamins, minerals) required for good health, as well as an upper safe level of nutrient intake (FAO/WHO, 2015).

2.5 CONTROVERSIES RELATED TO SPECIES LOCALITY

The below information raises issues related to the migration of food plant species and their resulting occurrence and use in new locations, which may be different from the use in centres of origin. It also discusses issues related to possible toxic and non-toxic adverse reactions associated with the consumption of local food plants, and the importance of hygiene in food preparation.

Widely used local food plants

Given that this book has an ethnobotanical approach – built on local knowledge – it takes into account the ‘locality’ of a species depending on the region or country from where it was reported. Certainly, locality refers to local agroecosystems and rural and indigenous cultures.

Some species may be considered local food plants for certain communities, but they are also widely cultivated in other parts of the world. Nevertheless, they have been included here to signify a role of these species in local communities and their diets that may distinctly differ from wide-scale and/or industrial use elsewhere and that may often be poorly documented in the literature. Their inclusion also exhibits the flexibility of use of (domesticated) species, heavily influenced by local agro-environmental conditions and cultural preferences. The following species have been reported by SD=HS communities as local food plants, whereas these same species are major- often industrially grown - crop plants elsewhere.

- *Allium cepa*
- *Arachis hypogea*
- *Beta vulgaris*
- *Brassica oleracea*
- *Brassica rapa*
- *Carica papaya*
- *Daucus carota*
- *Glycine max*
- *Hordeum vulgare*
- *Mangifera indica*
- *Phaseolus vulgaris*
- *Solanum lycopersicum*
- *Solanum melongena*
- *Sorghum bicolor*
- *Vicia faba*

Recognition by local communities

Furthermore, it is interesting to note that even in this survey across a limited number of countries, the same species may be considered a NUS in one country and not in the other, as is the case for the following species [Table 5]. Again, such differences may be strongly influenced by prevailing agroecosystems and food culture.

Table 5. *Food plant species variously considered a NUS or not by programme countries*

Species	Considered a NUS	Not considered a NUS
<i>Abelmoschus esculentus</i>	Uganda, Zimbabwe	Zambia
<i>Cleome gynandra</i>	Uganda, Zimbabwe	Zambia
<i>Colocasia esculenta</i>	Guatemala, Nepal	Laos
<i>Cucurbita maxima</i>	Uganda	Zambia, Zimbabwe
<i>Cucurbita moschata</i>	Guatemala	Laos
<i>Hibiscus sabdariffa</i>	Uganda, Nepal	Zambia
<i>Manihot esculenta</i>	Uganda	Zambia
<i>Pisum sativum</i>	Uganda	Peru
<i>Sesamum indicum</i>	Uganda	Laos
<i>Vigna subterranea</i>	Uganda, Zimbabwe	Zambia
<i>Vigna unguiculata</i>	Uganda, Zimbabwe	Zambia, Laos

Also, some countries may refer to a species as wild, whereas the species is known to originate and have been domesticated from another continent. Such reference may indicate that such species has been rewilded in the country from which it has been reported as wild. An example is the reference to *Passiflora edulis* as wild through our partner in Laos, whereas the species originates from Latin America and is grown widely in other regions as well. Such differences may also relate to ethnobotanical use rather than to agricultural practices. For example, the indigenous Mapuche in southern Chile do cultivate wheat, but in local food culture, it is consumed cooked or in a porridge and not used to produce bread.

Geographical distribution

In addition, the use of some of the species has only been reported by one or a few countries, whereas it is known that the same species are grown in other project countries (and of course beyond) as well. The absence of country information in a species description should not be taken to mean that such species has no food or agricultural significance in any of the other countries or communities where the SD=HS programme was implemented.

2.6 FURTHER CONSIDERATIONS ON POTENTIAL TOXICITY AND HYGIENE

Potential toxicity of food items

Although not specifically indicated in the species descriptions, it should be noted that adverse reactions to specific local food plants may occur. Such reactions can be either of a toxic or of a non-toxic-nature. Toxic reactions occur in all individuals who consume a food item that contains harmful compounds, while non-toxic reactions appear in a few individuals who do not tolerate certain compounds in a food item (Turcanu et al., 2017). The probabilities of such adverse reactions may be less known for minor crops and wild food plants, where fewer studies have been conducted. The lack of hygiene in the processing or preparation of food could also lead to disease.

Toxic food reactions are caused by toxins that exist in food naturally, or that are induced by food processing. In particular, if seeds of legumes in their raw state are ingested regularly or in large quantities,

toxic symptoms may potentially appear. These symptoms usually involve the central nervous system and may produce headaches and hallucinations. In addition, blood and liver problems may occur (Turcanu et al., 2017). Some examples of toxins that may cause such reactions are glucosinolates present in cabbage, aflatoxins in peanuts and grains, and furocoumarins in citrus fruits (Dolan et al., 2010), as well as cyanide in cassava and neurotoxins in the seed of grass pea. Other compounds, called anti-nutrients, can also be toxic when consumed in large amounts and lead to mischievous effects related to nutrient absorption. Some common symptoms exhibited by various antinutrients include nausea, bloating, headaches, rashes, and nutritional deficiencies. Phytates, oxalates, and lectins are a few well-known anti-nutrients (Popova & Mihaylova, 2019). The consumption of food which is contaminated with pesticides or other chemical residues may also cause disease. In conclusion, it is important to notify and evaluate the conditions of the sites where food is produced or gathered.

The importance of hygiene

Microbial contamination of food during production, processing, or preparation can lead to food-borne diseases and even death, presenting important public health concerns worldwide (Nowshad et al., 2021). More specifically, food-borne illnesses have been associated with improper storage or reheating, and cross-contamination (Anjum, 2020). Requisite food hygiene is crucial for the prevention of microbial contamination and food safety (Nowshad et al., 2021). For this reason, the US FDA has published a short list of recommendations for hygienic food preparation practices at home (FDA, 2022). These include:

- Always to wash your food, hands, counters, and cooking tools before each use.
- To keep raw foods apart. Germs can spread from one food item to another.
- To heat foods and keep them heated until consumption. Heat kills germs. Food is safely cooked when the internal temperature is high enough to kill germs that can make you sick.
- To put food in the fridge or freezer within two hours after cooking, purchasing, or using.

3 SPECIES DESCRIPTION

ABELMOSCHUS ESCULENTUS L.

English name
Okra

Scientific name
Abelmoschus esculentus L.

Local names
otigo · Luo, Uganda
mula · Uganda
derere, chipudzi · Zimbabwe

BOTANICAL INFORMATION

An annual herb that grows up to 2 m tall with succulent stems that are covered with small stiff hairs. The leaves are up to 50 cm in diameter and deeply lobed. The flowers are up to 8 cm in diameter with yellow on the outside and dark red on the inside. The fruits are ribbed capsules up to 20 cm long ^[1,2].

Growth form terrestrial herb
Life cycle annual
Centre of origin Sahel region ^[2]
Stress Tolerance Temperatures above 35°C delay the flowering and fruiting. Several fungal diseases affect the species, as well as the yellow vein mosaic virus, mainly in Asia. Several pests also target the plant ^[1].

DISTRIBUTION RANGE



Geographic locations where species has been reported to occur

NUTRITIONAL HIGHLIGHTS



- Fiber
- Riboflavin
- Vitamin B6
- Folate
- Vitamin C

- Calcium
- Magnesium
- Copper
- Manganese
- Phosphorus



- Fiber
- Vitamin B6
- Folate
- Vitamin C
- Magnesium
- Copper

ETHNOBOTANICAL INFORMATION

The immature fruits are eaten throughout the world. The fruits are rich in slimy mucilage, which can be used as a thickening agent. Young leaves are also frequently eaten as boiled or fried vegetables. Flower buds and petals are edible but less frequently used. The okra bark is a source of a strong coarse fiber, mainly used in West Africa ^[1,2].

Occurring in farming systems in	Zambia	Uganda	Zimbabwe
Level of domestication	domesticated	domesticated	domesticated
Considered a NUS	no	yes	yes
Edible parts	leaves, fruits	leaves, fruits	fruits
Contribution to food group(s)	vegetables, fruits	vegetables, fruits	fruits
Popular ways of preparation or preservation	boiled, fried or stir-fried, dried	boiled	boiled, fried or stir-fried
Growth place	agricultural field, home garden, forest, roadside	agricultural field, home garden	agricultural field, home garden, forest, riverside, other
Commercialization	yes	yes	yes

NUTRITIONAL INFORMATION

Nutrition item	Okra leaves, boiled ^[A]	Okra fruit, raw ^[B]
Energy (kcal)	77	61
Protein (grams)	4.1	2.7
Fiber (grams)	7.5 ●	5 ●
Thiamine (mg)	0.16	0.06
Riboflavin (mg)	0.41 ●	0.13
Niacin (mg NE)	0.1	1.1
Vitamin B6 (mg)	0.3 ●	0.34 ●
Folate (ug DFE)	90 ●	138 ●
Vitamin C (mg)	22 ●	44 ●
Vitamin A (ug RAE or RE)	77	41
Vitamin D (ug)	0	0
Vitamin E (mg)	1.12	0.57
Calcium (mg)	514 ●	104
Magnesium (mg)	74 ●	77 ●
Zinc (mg)	1.8	0.94
Iron (mg)	0.7	1.3
Copper (ug)	0.2 ●	0.14 ●
Manganese (ug)	2470 ●	
Sodium (g)	0	11
Potassium (mg)	317	382
Phosphorus (mg)	116 ●	95
Reference	^[3]	^[3]

Nutrition information is indicated per 100g of food plant item.

^[A] Leaves, okra, boiled, (Thelele lowlitsa) ^[B] Okra fruit, raw (Therere lobala)

Nutrients for which no information was found: Pantothenate (ug), Biotine (ug), Vitamin K (ug), Iodine (ug), Selenium (ug)



ADANSONIA DIGITATA L.

BOTANICAL INFORMATION

A large deciduous tree with a wide trunk. The leaves grow on the end of branches and consist of 5-7 leaflets. The tree has large white flowers which grow up to 20 cm in diameter and consist of 5 petals and many stamens. The fruit is big, up to 35 cm long, with a hard outside shell, and filled with a mealy white pulp and many dark brown kidney-shaped seeds ^[1].

Growth form tree
Life cycle perennial
Centre of origin Sub-Saharan Africa

DISTRIBUTION RANGE



Geographic locations where species has been reported to occur

NUTRITIONAL HIGHLIGHTS

- 
 - Fiber
 - Thiamine
 - Vitamin C
 - Magnesium
 - Zinc
 - Iron
 - Copper
 - Manganese
 - Potassium
- 
 - Protein
 - Fiber
 - Thiamine
 - Calcium
 - Iron
- 
 - Vitamin A
 - Calcium

ETHNOBOTANICAL INFORMATION

The baobab is culturally a very important tree with many uses throughout most of Sub-Saharan Africa. The fruit pulp is eaten raw or used to make drinks, the seeds are used as a thickener, and the leaves can be cooked as a vegetable. Fibers from the bark are used for ropes and basketry. All plant parts are used as medicine for many different ailments, including digestive ailments, infections, and skin problems. The trees furthermore serve as social gathering places or waypoints in the landscape and often hold spiritual significance ^[1].

Occurring in farming systems in	Zimbabwe
Level of domestication	wild
Considered a NUS	yes
Edible parts	fruits, leaves
Contribution to food group(s)	fruits, vegetables
Popular ways of preparation or preservation	raw, boiled
Growth place	home garden, wild areas
Commercialization	no

NUTRITIONAL INFORMATION

Nutrition item	Baobab fruit, raw ^[A]	Baobab seeds, dried ^[B]	Baobab leaves, fresh ^[C]
Energy (kcal)	349	490	69
Protein (grams)	2.7	30 ●	3.8
Fiber (grams)	7.2 ●	3 ●	2.8
Thiamine (mg)	0.39 ●	1.4 ●	
Riboflavin (mg)	0.06	0.13	
Niacin (mg NE)	2.2		
Vitamin B6 (mg)	0.02		
Vitamin C (mg)	258 ●		
Vitamin A (ug RAE or RE)	6	0	3000 ●
Vitamin D (ug)	0		
Calcium (mg)	100	266 ●	402 ●
Magnesium (mg)	181 ●		
Zinc (mg)	3.75 ●		
Iron (mg)	5 ●	14 ●	
Copper (ug)	0.73 ●		
Manganese (ug)	181 ●		
Sodium (g)	0		
Potassium (mg)	2462 ●		
Phosphorus (mg)	39		
Reference	[2]	[3]	[3]

Nutrition information is indicated per 100g of food plant item.

^[A] Baobab fruit, raw, Adansonia digitata, Malambe ^[B] Baobab seeds (dry) Adansonia Digitata

^[C] Baobab leaves (fresh) Adansonia Digitata (ug)

Nutrients for which no information was found: Pantothenate (ug), Biotine (ug), Folate (ug DFE), Vitamin E (mg), Vitamin K (ug), Iodine (ug), Selenium (ug)



ALLIUM SCHOENOPRASUM L.

English name
chives

Scientific name
Allium schoenoprasum L.

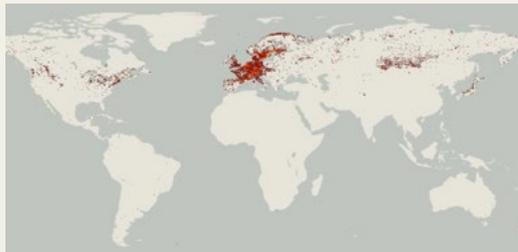
Local names
cebollín · Guatemala

BOTANICAL INFORMATION

A perennial herb that comes in many shapes. Generally speaking, the underground part of the plant consists of numerous oblong bulbs of 0.5–3 cm long. The above-ground parts of the plant consist of 15–50 cm tall tubular-shaped hollow leaves. The purple flowers grow close together forming half spheres of up to 2 cm in diameter ^[1].

Growth form terrestrial herb
Life cycle Perennial ^[1]
Centre of origin Northern hemisphere ^[1]

DISTRIBUTION RANGE



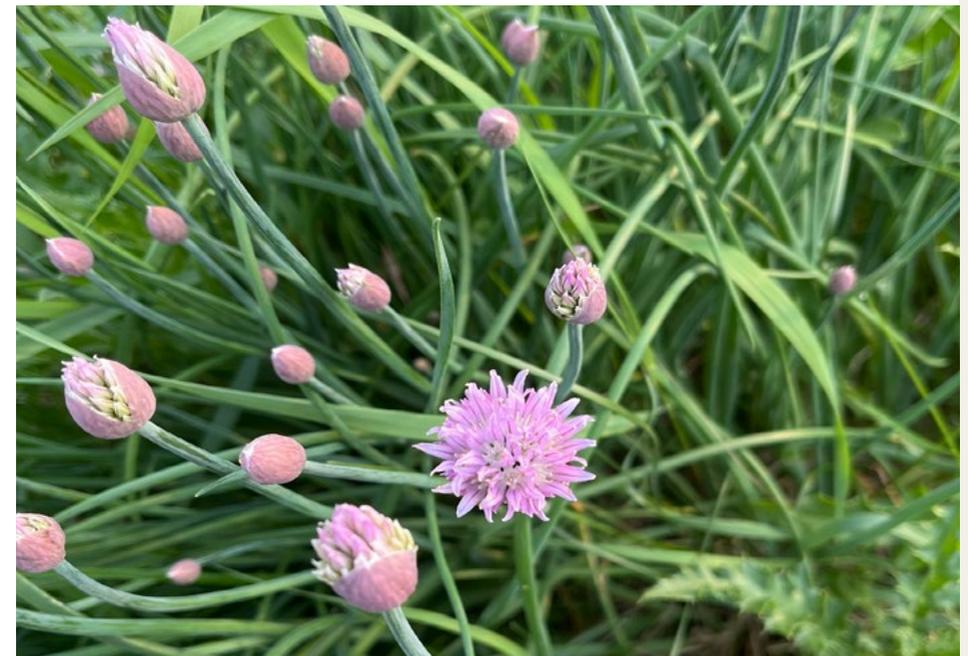
Geographic locations where species has been reported to occur

ETHNOBOTANICAL INFORMATION

Chives are widely cultivated and eaten around the world. The leaves and flowers are eaten raw in salads or used as condiment. The plant is also grown for its ornamental flowers ^[1].

Occurring in farming systems in	Guatemala
Level of domestication	domesticated
Considered a NUS	yes
Edible parts	roots/tubers; stem, leaves
Contribution to food group(s)	tubers and roots; vegetables
Popular ways of preparation or preservation	raw
Growth place	home garden, forest
Commercialization	market

No nutritional information was found for *Allium schoenoprasum*



AMARANTHUS CAUDATUS L.

BOTANICAL INFORMATION

A tall herb growing up to 2.5 m tall with red tints throughout the plant. The leaves are roughly oval-shaped, 3-15 cm long and 1-8 cm wide, and are spirally arranged around the stem. The most striking feature of this plant are its purple-red flowers which are numerous and grow closely together on often drooping stalks of up to 1.5 meter long. Seeds are smooth, shiny, and ivory, reddish or dark brown in color, with a round shape up to 1.5 mm in diameter ^[1].

Growth form herb ^[1]
 Life cycle annual ^[1]
 Centre of origin South America

DISTRIBUTION RANGE



Geographic locations where species has been reported to occur

NUTRITIONAL HIGHLIGHTS



- Calcium
- Magnesium
- Iron
- Potassium



- Protein
- Fiber
- Riboflavin
- Calcium
- Magnesium
- Zinc
- Iron

- Copper
- Potassium
- Phosphorus



- Protein
- Fiber
- Calcium
- Zinc
- Iron
- Potassium
- Phosphorus

ETHNOBOTANICAL INFORMATION

Grain amaranth has been grown in South America for millennia, where it was an important and highly nutritious staple food for many people. It is now also occasionally cultivated in Asia or Africa. The seeds can be eaten toasted, popped, ground into flour, or boiled and the leaves are edible after cooking. The harvest leftovers serve as animal fodder. The plant is furthermore used for dyeing fabric and appreciated for its ornamental value ^[1,2].

Occurring in farming systems in	Peru
Level of domestication	domesticated
Considered a NUS	yes
Edible parts	seeds
Contribution to food group(s)	legumes, nuts and seeds
Popular ways of preparation or preservation	boiled
Commercialization	yes

NUTRITIONAL INFORMATION

Nutrition item	Amaranth leaves, raw ^[A]	Amaranth leaves, dried ^[B]	Amaranth leaves, flour ^[C]
Energy (kcal)			352
Protein (grams)		28.8 ●	12.2 ●
Fiber (grams)	1.5	7 ●	8.4 ●
Riboflavin (mg)		0.6 ●	
Vitamin C (mg)		5.6	
Calcium (mg)	339 ●	3348 ●	214 ●
Magnesium (mg)	146 ●	1589 ●	
Zinc (mg)		5.5 ●	3.76 ●
Iron (mg)	5 ●	23.2 ●	5.3 ●
Copper (ug)		1.6 ●	
Sodium (g)			0
Potassium (mg)	653 ●	4250 ●	663 ●
Phosphorus (mg)	64	248 ●	360 ●
Reference	[3]	[3]	[4]

Nutrition information is indicated per 100g of food plant item.

^[A] Amaranth, leaves, raw ^[B] Love-lies-bleeding/ love-lies-a'bleeding/ pendant amaranth/ tassel flower/ velvet flower/ foxtail amaranth/ quelite, leaf, dried, raw ^[C] Kiwicha, harina de Nutrients for which no information was found: Thiamine (mg), Niacin (mg NE), Vitamin B6 (mg), Pantothenate (ug), Biotine (ug), Folate (ug DFE), Vitamin A (ug RAE or RE), Vitamin D (ug), Vitamin E (mg), Vitamin K (ug), Iodine (ug), Selenium (ug), Manganese (ug), Sodium (g)



AMARANTHUS CRUENTUS L.

BOTANICAL INFORMATION

A tall herb growing up to 2 m tall with red tints throughout all of the plant. The leaves are roughly oval-shaped, 2-15 cm long and 2-8 cm wide and spirally arranged around the stem. The most striking feature of this plant is its purple-red flowers which are numerous and grow closely together on stalks of up to 45 cm long. Seeds are whitish, yellowish or blackish, oval-shaped and up to 1 mm long ^[1].

Growth form: terrestrial herb
 Life cycle: annual
 Centre of origin: Central America ^[1]

DISTRIBUTION RANGE



Geographic locations where species has been reported to occur

NUTRITIONAL HIGHLIGHTS



- Protein
- Fiber
- Thiamine
- Riboflavin
- Calcium
- Magnesium

- Zinc
- Iron
- Copper
- Manganese
- Phosphorus



- Protein
- Fiber
- Thiamine
- Riboflavin
- Calcium
- Magnesium
- Zinc
- Iron
- Copper
- Manganese
- Phosphorus

ETHNOBOTANICAL INFORMATION

African spinach has been cultivated for millennia throughout the Americas, mainly for its edible seeds. The plant is nowadays also widely cultivated throughout tropical Africa and South and South East Asia, where it is more commonly used as a leafy vegetable. The fresh leaves and tender stems are cooked or fried and dried leaves can be ground and used in sauces. The seeds can be toasted, ground into flour, or boiled. The plant is also used as animal fodder, as an ornamental, and as a source of dye. The plant has many medicinal uses, including as a laxative and a diuretic and to treat fever, hemorrhage, anemia, and kidney complaints ^[1].

Occurring in farming systems in	Zambia
Level of domestication	semidomesticated
Considered a NUS	no
Edible parts	leaves and shoots
Contribution to food group(s)	vegetables
Popular ways of preparation or preservation	boiled, fried or stir-fried, steamed
Growth place	agricultural field, home garden, forest, roadside, other
Commercialization	yes

NUTRITIONAL INFORMATION

Nutrition item	Amaranth grain, flour, raw ^[A]	Amaranth grain, flour, steamed ^[B]
Protein (grams)	17.2 ●	16.7 ●
Fiber (grams)	3.8 ●	3.1 ●
Thiamine (mg)	0.6 ●	0.2 ●
Riboflavin (mg)	0.5 ●	0.5 ●
Niacin (mg NE)	1.4	0.9
Vitamin C (mg)	1.1	0.6
Calcium (mg)	190 ●	189 ●
Magnesium (mg)	220 ●	219 ●
Zinc (mg)	5.2 ●	4.8 ●
Iron (mg)	13.9 ●	13 ●
Copper (ug)	0.6 ●	0.6 ●
Manganese (ug)	6 ●	6 ●
Sodium (g)	0	0
Potassium (mg)	326	324
Phosphorus (mg)	323 ●	322 ●
Reference	[3]	[3]

Nutrition information is indicated per 100g of food plant item.

^[A] Raw amaranth grain flour ^[B] Processed amaranth grain flour, steamed for 20 minutes

Nutrients for which no information was found: Energy (kcal), Vitamin B6 (mg), Pantothenate (ug), Biotine (ug), Folate (ug DFE), Vitamin A (ug RAE or RE), Vitamin D (ug), Vitamin E (mg), Vitamin K (ug), Iodine (ug), Selenium (ug)



AMARANTHUS HYBRIDUS L.

English name
smooth pigweed

Scientific name
Amaranthus hybridus L.

Local names
bledo · Guatemala

BOTANICAL INFORMATION

A tall herb growing up to 3 m tall, sometimes with red tints throughout all of the plant parts. The leaves are more or less shaped like an arrowhead, 3-19 cm long and 1.5-8 cm wide, and spirally arranged around the stem. The flowers can be yellowish green, red, or purple and grow closely together on spikes of up to 45 cm long. Seeds are shiny black or ivory colored, with a round shape up to 1.3 mm in diameter ^[1].

Growth form terrestrial herb
Life cycle annual
Centre of origin America

DISTRIBUTION RANGE



Geographic locations where species has been reported to occur

NUTRITIONAL HIGHLIGHTS



ETHNOBOTANICAL INFORMATION

Smooth pigweed is a type of amaranth that is very variable in form and it is likely an ancestor of many other amaranth species. The plant has been cultivated in Central America for millennia, where it was an important and highly nutritious staple food for many people. The plant now grows around the tropical, subtropical, and temperate parts of the world. The most important part of the plant is its seeds, which can be eaten toasted, popped, ground into flour, or boiled. The leaves are also edible after cooking and the harvest leftovers serve as animal fodder ^[1].

Occurring in farming systems in	Guatemala
Level of domestication	domesticated
Considered a NUS	no
Edible parts	roots/tubers, leaves
Contribution to food group(s)	tubers and roots, vegetables
Popular ways of preparation or preservation	boiled
Growth place	agricultural field, home garden, roadside, other
Commercialization	yes

NUTRITIONAL INFORMATION

Nutrition item	Amaranth leaves, raw ^[A]	Amaranth leaves, sun dried ^[B]	Amaranth leaves, blanched ^[C]
Protein (grams)	4.3	4.6	4.1
Fiber (grams)	1.6	3.4	2
Vitamin C (mg)	58.1 ●	36.7 ●	31.9 ●
Reference	[2]	[2]	[2]

Nutrition information is indicated per 100g of food plant item.

^[A] Amaranth leaves, raw ^[B] Amaranth leaves, sun dried ^[C] Amaranth leaves, blanched

Nutrients for which no information was found: Energy (kcal), Thiamine (mg), Riboflavin (mg), Niacin (mg NE), Vitamin B6 (mg), Pantothenate (ug), Biotine (ug), Folate (ug DFE), Vitamin A (ug RAE or RE), Vitamin D (ug), Vitamin E (mg), Vitamin K (ug), Calcium (mg), Magnesium (mg), Zinc (mg), Iron (mg), Iodine (ug), Selenium (ug), Copper (ug), Manganese (ug), Sodium (g), Potassium (mg), Phosphorus (mg)



AMARANTHUS HYBRIDUS L.

SUBSP. QUITENSIS

BOTANICAL INFORMATION

The plant is usually red or purple in colour and produces black seeds ^[1].

Growth form terrestrial herb
 Life cycle perennial
 Centre of origin Andes

DISTRIBUTION RANGE



Geographic locations where species has been reported to occur

NUTRITIONAL HIGHLIGHTS



- Protein
- Fiber



ETHNOBOTANICAL INFORMATION

The ataco is usually cultivated at altitudes ranging from 2,000 to 3,000 m.a.s.l., found alone or associated with other crops. It is traditionally known by the name of ataco, sangorache, or black amaranth. The plant is usually red or purple in color and produces black seeds. Farmers in the Andean highlands use ataco or sangorache as a natural medicine through infusions of leaves and inflorescences ^[2]. Furthermore, the inflorescence is used to obtain dyes for the production of traditional beverages ^[1].

Occurring in farming systems in	Peru
Level of domestication	wild
Considered a NUS	yes
Edible parts	leaves, shoots
Contribution to food group(s)	vegetables
Popular ways of preparation or preservation	raw, boiled, steamed
Growth place	agricultural field, home garden
Commercialization	yes

NUTRITIONAL INFORMATION

Nutrition item	Amaranth leaves, flour ^[A]
Protein (grams)	18.95 ●
Fiber (grams)	21.04 ●
Reference	[3]

Nutrition information is indicated per 100g of food plant item. ^[A] Native amaranth flour
 Nutrients for which no information was found: Energy (kcal), Thiamine (mg), Riboflavin (mg), Niacin (mg NE), Vitamin B6 (mg), Pantothenate (ug), Biotine (ug), Folate (ug DFE), Vitamin A (ug RAE or RE), Vitamin D (ug), Vitamin E (mg), Vitamin K (ug), Calcium (mg), Magnesium (mg), Zinc (mg), Iron (mg), Iodine (ug), Selenium (ug), Copper (ug), Manganese (ug), Sodium (g), Potassium (mg), Phosphorus (mg)

AMARANTHUS THUNBERGII L.

English name
pigweed

Scientific name
Amaranthus thunbergii L.

Local names
mowa · Zimbabwe

BOTANICAL INFORMATION

A small herb growing up to 50 cm tall. The lower parts of the plant sometimes grow on the ground and are without hairs, the ascending branches higher up get more hairy. The leaves are roughly oval-shaped, 1.5–4.5 cm long and 1–3 cm wide, and spirally arranged around the stem. The small green flowers grow throughout the plant on small clusters of about 1.5 cm in diameter which are positioned at the base of the leaves. Seeds are black or dark brown, oval-shaped shaped, and up to 1.5 mm long ^[1].

Growth form terrestrial herb
Life cycle annual
Centre of origin Sub-Saharan Africa

DISTRIBUTION RANGE



Geographic locations where species has been reported to occur

NUTRITIONAL HIGHLIGHTS



- Calcium
- Magnesium
- Iron
- Copper



- Protein
- Riboflavin
- Vitamin C
- Vitamin A

- Calcium
- Magnesium
- Iron
- Manganese

ETHNOBOTANICAL INFORMATION

Pigweed is a species of Amaranth that is native to Sub-Saharan Africa, while most other Amaranth species originate from South America. The leaves, which are a bit more bitter than those of other Amaranth species, are eaten fresh, cooked, or dried and also used as fodder for livestock. In Zimbabwe, the ground and dried flower heads are sometimes used as an additive to tobacco snuff to make it milder ^[1].

Occurring in farming systems in	Zimbabwe
Level of domestication	semi-domesticated
Considered a NUS	yes
Edible parts	leaves
Contribution to food group(s)	vegetables
Popular ways of preparation or preservation	boiled, fried or stir-fried
Growth place	agricultural field
Commercialization	no

NUTRITIONAL INFORMATION

Nutrition item	Amaranth leaves, raw ^[A]	Amaranth leaves, boiled ^[B]
Energy (kcal)		57
Protein (grams)	4	5.7 ●
Fiber (grams)	2.6	1.9
Thiamine (mg)	0.07	0.04
Riboflavin (mg)	0.05	0.29 ●
Niacin (mg NE)		0.7
Vitamin B6 (mg)		0.16
Folate (ug DFE)		52
Vitamin C (mg)		24 ●
Vitamin A (ug RAE or RE)		283 ●
Vitamin D (ug)		0
Vitamin E (mg)		0.31
Calcium (mg)	288 ●	372 ●
Magnesium (mg)	124 ●	135 ●
Zinc (mg)	0.72	1.3
Iron (mg)	12.5 ●	6.1 ●
Copper (ug)	0.26 ●	0.1
Manganese (ug)		1888 ●
Sodium (g)	13.3	0
Potassium (mg)	351	443
Phosphorus (mg)	62.1	68
Reference	[2]	[3]

Nutrition information is indicated per 100g of food plant item.

^[A] Thunberg's amaranth, leaf, raw ^[B] Leaves, amaranth, boiled, *Amaranthus thunbergii*, Bonongwe wowilitsa
Nutrients for which no information was found: Pantothenate (ug), Biotine (ug), Vitamin K (ug), Iodine (ug), Selenium (ug)



AMARANTHUS TORTUOSUS L.

BOTANICAL INFORMATION

An annual herb growing up to 1.5 m tall. The leaves are roughly oval, 1.5-12 cm long, and 1-8 cm wide and spirally arranged around the stem. Its small green flowers grow closely together on stalks of up to 25 cm long. Seeds are black, lentil-shaped, and up to 1 mm wide ^[1].

Growth form terrestrial herb
Life cycle annual
Centre of origin Tropical America ^[1]

DISTRIBUTION RANGE



Geographic locations where species has been reported to occur

NUTRITIONAL HIGHLIGHTS



- Calcium
- Magnesium
- Zinc
- Iron
- Copper
- Manganese

ETHNOBOTANICAL INFORMATION

Spleen amaranth is used as a leafy vegetable throughout the tropical parts of the Americas, Africa, and Asia, though other Amaranth species are generally preferred. The leaves of the plant are cooked for several minutes until they become soft. The plant is also used as a medicine for fever, hemorrhage, anemia, constipation, kidney complaints, and stomach-ache ^[1].

Occurring in farming systems in	Uganda
Level of domestication	semi-domesticated
Considered a NUS	yes
Edible parts	leaves
Contribution to food group(s)	vegetables
Popular ways of preparation or preservation	boiled, steamed
Growth place	agricultural fields, home garden
Commercialization	yes

NUTRITIONAL INFORMATION

Nutrition item	Wild spinach, raw
Energy (kcal)	49
Protein (grams)	4
Fiber (grams)	2.87
Calcium (mg)	252.9 ●
Magnesium (mg)	120.9 ●
Zinc (mg)	8.4 ●
Iron (mg)	3.75 ●
Copper (ug)	0.45 ●
Manganese (ug)	12 ●
Sodium (g)	0
Phosphorus (mg)	73.05
Reference	[2]

Nutrition information is indicated per 100g of food plant item.

Nutrients for which no information was found: Thiamine (mg), Riboflavin (mg), Niacin (mg NE), Vitamin B6 (mg), Pantothenate (ug), Biotine (ug), Folate (ug DFE), Vitamin C (mg), Vitamin A (ug RAE or RE), Vitamin D (ug), Vitamin E (mg), Vitamin K (ug), Iodine (ug), Selenium (ug), Potassium (mg)



AMARANTHUS VIRIDIS L.

English name
green amaranth ^[1]

Scientific name
Amaranthus viridis L.

Local names
ຜັກຫິມີ · Lao

Transliterated names
phuk hom · Lao

BOTANICAL INFORMATION

A herb growing up to 1 meter tall. The lower parts of the plant are without hairs, the upper part is sometimes sparsely covered with thin hairs. The leaves are roughly shaped like an arrowhead, 2-8 cm long and 1.5-6 cm wide. The small green flowers grow on spikes that are up to 12 cm long, which are positioned mainly at the top of the plant or sometimes at the base of the leaves. Seeds are glossy black, round, and up to 1 mm in diameter ^[1].

Growth form terrestrial herb
Life cycle annual
Centre of origin unknown

DISTRIBUTION RANGE

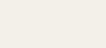


Geographic locations where species has been reported to occur

NUTRITIONAL HIGHLIGHTS



- Fiber
- Riboflavin
- Vitamin B6
- Folate



- Vitamin C
- Vitamin A
- Calcium



- Vitamin C
- Vitamin A
- Calcium

ETHNOBOTANICAL INFORMATION

This cosmopolitan plant grows throughout the world in tropical, subtropical, and temperate regions. The leaves and young plants as a whole are eaten after cooking. The plant is also used as food for livestock and made into a poultice to treat inflammations and swellings ^[1].

Occurring in farming systems in	Laos
Level of domestication	domesticated
Considered a NUS	no
Edible parts	leaves
Contribution to food group(s)	vegetables
Popular ways of preparation or preservation	boiled, steamed
Growth place	agricultural field, forest
Commercialization	no

NUTRITIONAL INFORMATION

Nutrition item	Green amaranth, fresh ^[A]	Green amaranth, blanched ^[B]
Energy (kcal)	35	21
Protein (grams)	3.6	2.11
Fiber (grams)	3.8 ●	0
Thiamine (mg)	0.03	0.02
Riboflavin (mg)	0.27 ●	0.13
Niacin (mg NE)	1.1	0.55
Vitamin B6 (mg)	0.25 ●	0.17
Folate (ug DFE)	113.53 ●	57
Vitamin C (mg)	49 ●	41.1 ●
Vitamin A (ug RAE or RE)	255 ●	139 ●
Calcium (mg)	190 ●	209 ●
Zinc (mg)	1.2	0.88
Iron (mg)	3.1	2.26
Reference	[2]	[2]

Nutrition information is indicated per 100g of food plant item.

^[A] Green amaranth, small, fresh ^[B] Green amaranth, small, blanched

Nutrients for which no information was found: Pantothenate (ug), Biotine (ug), Vitamin D (ug), Vitamin E (mg), Vitamin K (ug), Magnesium (mg), Iodine (ug), Selenium (ug), Copper (ug), Manganese (ug), Sodium (g), Potassium (mg), Phosphorus (mg)



AVENA SATIVA L.

English name
oats

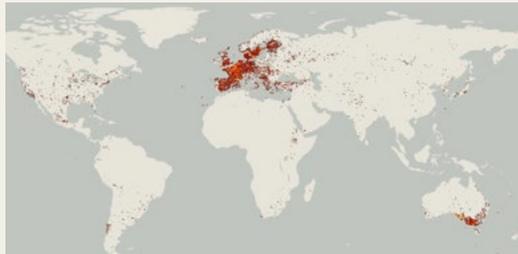
Scientific name
Avena sativa L.

BOTANICAL INFORMATION

An annual herb growing 40-180 cm tall. It is a type of grass, and thus it consists of one central stem to which the leaves and flowers/seeds are attached. The leaves of oats grow mainly on the upper part of the stem and are 14-40 cm long and 5-15 cm wide. Between the main stem and each leaf grows a ligule, which is a small lip-shaped membrane, which is hairless and 3-6 mm long. The green flowers, which later grow into oat seeds, are widely distributed at the top of each plant and hang slightly down. The flowers grow in small groups of 2-3, and many of these groups together make up all the flowers of the plant ^[1].

Growth form terrestrial herb
Life cycle annual ^[1]
Centre of origin Near East
Stress Tolerance tolerant to low temperatures

DISTRIBUTION RANGE



Geographic locations where species has been reported to occur

NUTRITIONAL HIGHLIGHTS



- Protein
- Thiamine
- Magnesium
- Zinc

- Iron
- Copper
- Manganese
- Phosphorus



- Protein
- Thiamine
- Magnesium
- Zinc

- Iron
- Copper
- Manganese
- Phosphorus

ETHNOBOTANICAL INFORMATION

The seeds of oat plants, which themselves are also called oats, are eaten after boiling or ground into flour and used for baking. The plants are also used to feed livestock. A porridge made of the seeds is used to treat skin disorders ^[2]. The crop is still widely known in Europe, although its role in cropping systems has largely disappeared.

Occurring in farming systems in	Peru
Level of domestication	domesticated
Considered a NUS	no
Edible parts	seeds
Contribution to food group(s)	cereals
Popular ways of preparation or preservation	dried or dehydrated
Growth place	agricultural field
Commercialization	yes

NUTRITIONAL INFORMATION

Nutrition item	Oat, flakes	Oat, flour
Energy (kcal)	379	404
Protein (grams)	16.2 ●	14.66 ●
Fiber (grams)	1.2	1.3
Thiamine (mg)	0.53 ●	0.69 ●
Riboflavin (mg)	0.11	0.13
Niacin (mg NE)	0.82	1.47
Vitamin B6 (mg)	0.1	0.13
Folate (ug DFE)	32	32
Vitamin C (mg)	0	0
Vitamin A (ug RAE or RE)	0	0
Calcium (mg)	61	55
Magnesium (mg)	138 ●	144 ●
Zinc (mg)	3.64 ●	3.2 ●
Iron (mg)	3.35 ●	4 ●
Selenium (ug)	0.03	0.03
Copper (ug)	0.39 ●	0.44 ●
Manganese (ug)	4 ●	4 ●
Sodium (g)	6	19
Potassium (mg)	362	371
Phosphorus (mg)	278 ●	452 ●
Reference	[3]	[3]

Nutrition information is indicated per 100g of food plant item.

Nutrients for which no information was found: Pantothenate (ug), Biotine (ug), Vitamin D (ug), Vitamin E (mg), Vitamin K (ug), Iodine (ug)



Avena sativa

BASELLA ALBA L.

BOTANICAL INFORMATION

An annual or short-lived perennial twining herb up to 6 meters long. The stem is slender and smooth and can be either green or purplish in color. The fleshy leaves, which can be dark green or purplish, are round to heart-shaped, 5-15 cm in diameter, and are positioned alternately on the stem. The small flowers are white, pink, or purple, and grow together on a sometimes hanging spike of 3-21 cm long. The fruits are small black round berries of 4-10 mm in diameter and contain purple juice ^[1].

Growth form terrestrial herb
Life cycle annual
Centre of origin South Asia ^[1]

DISTRIBUTION RANGE



Geographic locations where species has been reported to occur

NUTRITIONAL HIGHLIGHTS

 
• Vitamin C

 
• Vitamin C

 
• Vitamin C



ETHNOBOTANICAL INFORMATION

The leaves and young shoots can be eaten raw, boiled, or fried and are an important leaf vegetable in parts of South and South-East Asia. The red juice obtained from the fruits can furthermore be used as an ink, a dye, and for coloring food ^[1].

Occurring in farming systems in	Nepal
Level of domestication	domesticated
Considered a NUS	yes
Edible parts	leaves
Contribution to food group(s)	vegetables
Popular ways of preparation or preservation	fried or stir-fried

NUTRITIONAL INFORMATION

Nutrition item	Spinach leaves, raw ^[A]	Spinach leaves, blanched ^[B]	Spinach leaves, sun dried ^[C]
Protein (grams)	3.8	3.6	4.2
Fiber (grams)	1.3	1.9	2.7
Vitamin C (mg)	98.1 ●	54.2 ●	59.3 ●
Reference	[2]	[2]	[2]

Nutrition information is indicated per 100g of food plant item.

^[A] Creeping spinach, leaves, raw ^[B] Creeping spinach, leaves, blanched ^[C] Creeping spinach, leaves, sun dried
Nutrients for which no information was found: Energy (kcal), Thiamine (mg), Riboflavin (mg), Niacin (mg NE), Vitamin B6 (mg), Pantothenate (ug), Biotine (ug), Folate (ug DFE), Vitamin A (ug RAE or RE), Vitamin D (ug), Vitamin E (mg), Vitamin K (ug), Calcium (mg), Magnesium (mg), Zinc (mg), Iron (mg), Iodine (ug), Selenium (ug), Copper (ug), Manganese (ug), Sodium (g), Potassium (mg), Phosphorus (mg)

BIDENS PILOSA L.

BOTANICAL INFORMATION

An annual herb growing up to 1 m tall with thin four-angled stems. The leaves consist of 3-5 leaflets and grow up to 20 cm long. Leaves grow in pairs opposite from each other, and each pair is positioned on the stem at a straight angle from the ones below and above it. The leaflets are oval-shaped and have toothed leaf edges. The flowers are 6-12 mm in diameter, yellow on the inside with 4-8 white to yellow or pinkish flower leaves on the outside. When the seeds are still on the plant they create a sort of spiky sphere. Each brown to black seed is 4-13 mm long and is barbed at the top, which makes it stick to animal fur or clothing.

Growth form: terrestrial herb
 Life cycle: annual
 Centre of origin: South America

DISTRIBUTION RANGE



Geographic locations where species has been reported to occur

NUTRITIONAL HIGHLIGHTS

- 

 - Fiber
 - Calcium
- 

 - Protein
 - Iron

ETHNOBOTANICAL INFORMATION

Blackjack originated in South America but is now found all over the world. The young shoots and leaves of this plant are edible and are eaten fresh, in stews, or dried and ground into a powder for later use. Old leaves are not eaten as they have a bitter taste. The plant is also used worldwide for numerous medicinal applications, as it has antibacterial, anti-inflammatory, and antimalarial properties. The plant is not suitable as feed for cows as it gives the milk a bad taste.^[1]

Occurring in farming systems in	Zambia	Guatemala	Zimbabwe
Level of domestication	semi-domesticated	domesticated	semi-domesticated
Considered a NUS	yes	yes	yes
Edible parts	leaves	leaves	leaves
Contribution to food group(s)	vegetables	vegetables	vegetables
Popular ways of preparation or preservation	boiled, fried or stir-fried, dried	boiled	boiled, fried or stir-fried
Growth place	agricultural field, home garden, forest, roadside	agricultural field, home garden, forest	agricultural field, home garden, forest
Commercialization	yes	yes	no

NUTRITIONAL INFORMATION

Nutrition item	Black jack, raw ^[A]	Black jack, boiled ^[B]	Black jack, cooked ^[C]
Energy (kcal)	43	95	33
Protein (grams)	3.8	8.29 ●	2.8
Fiber (grams)	3.9 ●		1.3
Vitamin C (mg)		0.42	
Calcium (mg)	340 ●	0.69	111
Zinc (mg)		1.36	
Iron (mg)		13.13 ●	2.3
Phosphorus (mg)	67		39
Reference	[2]	[3]	[2]

Nutrition information is indicated per 100g of food plant item.

^[A] Beggartics, railway, black jack, spanish needles, raw ^[B] Black jack boiled

^[C] Beggartics, railway, black jack, spanish needles, cooked

Nutrients for which no information was found: Thiamine (mg), Riboflavin (mg), Niacin (mg NE), Vitamin B6 (mg), Pantothenate (ug), Biotine (ug), Folate (ug DFE), Vitamin A (ug RAE or RE), Vitamin D (ug), Vitamin E (mg), Vitamin K (ug), Magnesium (mg), Iodine (ug), Selenium (ug), Copper (ug), Manganese (ug), Sodium (g), Potassium (mg)

BRASSICA CARINATA L.

BOTANICAL INFORMATION

An annual (or sometimes biennial or perennial) herb that grows up to 1.5 m tall when not in flower and up to 2 m tall when flowering. The plant often has a single stem with several branches. The more or less oval leaves of the plant are up to 20 cm long and 10 cm wide. The multiple flowers grow on a single long stalk about 50 cm above the rest of the plant. The flowers are yellow, 1-2 cm in diameter, and have 4 petals arranged in a cross shape. The fruits are shaped like a bean pod and are 2.5-6 cm long. The seeds are pale to dark brown, round, and 1-1.5 mm in diameter ^[1].

Life cycle annual
Centre of origin Ethiopia
Stress Tolerance Ethiopian mustard is sensitive to salty soils ^[1].

DISTRIBUTION RANGE



Geographic locations where species has been reported to occur

NUTRITIONAL HIGHLIGHTS



- Protein
- Vitamin C
- Iron

ETHNOBOTANICAL INFORMATION

The leaves of Ethiopian mustard are cooked as a leafy vegetable. The seeds of the plant have a strong mustard-like taste and are used as a spice and, especially in Ethiopia, are used as a cooking oil. The oil made from the seeds is also used for industrial purposes, such as making biodiesel ^[1].

Occurring in farming systems in	Zimbabwe
Level of domestication	domesticated
Considered a NUS	yes
Edible parts	leaves
Contribution to food group(s)	vegetables
Popular ways of preparation or preservation	boiled, fried or stir-fried
Growth place	home garden
Commercialization	no

NUTRITIONAL INFORMATION

Nutrition item	Rape leaves, boiled ^[A]
Energy (kcal)	78
Protein (grams)	6.76 ●
Vitamin C (mg)	49.37 ●
Calcium (mg)	0.61
Zinc (mg)	0.13
Iron (mg)	5.53 ●
Reference	[2]

Nutrition information is indicated per 100g of food plant item. ^[A] Rape fresh, boiled, Brassica Carinata
Nutrients for which no information was found: Fiber (grams), Thiamine (mg), Riboflavin (mg), Niacin (mg NE), Vitamin B6 (mg), Pantothenate (ug), Biotine (ug), Folate (ug DFE), Vitamin A (ug RAE or RE), Vitamin D (ug), Vitamin E (mg), Vitamin K (ug), Magnesium (mg), Iodine (ug), Selenium (ug), Copper (ug), Manganese (ug), Sodium (g), Potassium (mg), Phosphorus (mg)



CAJANUS CAJAN L.

BOTANICAL INFORMATION

A perennial small shrub growing up to 4 m tall with one main stem and many thin branches. Each leaf consists of a leafstalk of 1-8 cm long and three oval leaflets, each one 2.5-13.5 cm long and 1-5.5 cm wide. The flowers are often yellow, but can also be orange, red, or purple and are up to 2 cm big. The fruit is a pod of 2-10 cm long and 1-1.5 cm wide, containing 4-9 round seeds which are either white, brown, purple or black ^[1,2].

Growth form shrub
 Life cycle perennial ^[1]
 Centre of origin India

DISTRIBUTION RANGE

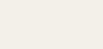


Geographic locations where species has been reported to occur

NUTRITIONAL HIGHLIGHTS



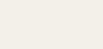
- Protein
- Fiber
- Thiamine
- Niacin
- Vitamin B6
- Folate
- Vitamin K



- Magnesium
- Zinc
- Iron
- Copper
- Manganese
- Phosphorus



- Protein
- Fiber
- Thiamine
- Folate
- Vitamin K
- Magnesium
- Copper



- Manganese
- Phosphorus

ETHNOBOTANICAL INFORMATION

Pigeon peas which are the seeds of the plant have a nutty taste and are high in protein. The peas can be cooked in many ways, for example as a sauce, fried or boiled into a porridge. The young seed pods can also be eaten after cooking. The leaves and seedpods are furthermore fed to livestock. The plant acts as a natural fertilizer by storing nitrogen in the ground and the leaves and roots are used as medicine for a wide range of ailments ^[1].

Occurring in farming systems in	Uganda
Level of domestication	domesticated
Considered a NUS	yes
Edible parts	seeds
Contribution to food group(s)	legumes
Popular ways of preparation or preservation	boiled, fried or stir-fried, dried
Growth place	agricultural field, home garden, roadside, other
Commercialization	yes

NUTRITIONAL INFORMATION

Nutrition item	Pigeon pea, dry ^[A]	Pigeon pea, boiled ^[B]
Energy (kcal)	640	364
Protein (grams)	21.2 ●	7.8 ●
Fiber (grams)	9 ●	8.6 ●
Thiamine (mg)	0.61 ●	1.15 ●
Riboflavin (mg)	0.18	0.06
Niacin (mg NE)	2.7 ●	0.8
Vitamin B6 (mg)	0.27 ●	0.08
Folate (ug DFE)	356 ●	97 ●
Vitamin C (mg)	0	0
Vitamin A (ug RAE or RE)	8	0
Vitamin D (ug)	0	0
Vitamin E (mg)	0.39	0
Vitamin K (ug)	971 ●	446 ●
Calcium (mg)	112	42
Magnesium (mg)	179 ●	67 ●
Zinc (mg)	2.2 ●	0.9
Iron (mg)	6.1 ●	1.7
Copper (ug)	1.2 ●	0.4 ●
Manganese (ug)	1310 ●	470 ●
Sodium (g)	0	6
Potassium (mg)	344	140
Phosphorus (mg)	344 ●	140 ●
Reference	[3]	[3]

Nutrition information is indicated per 100g of food plant item.

^[A] Pigeon pea, dry, *Cajanus cajan* (Nandoto wowuma) ^[B] Pigeon pea, green, boiled, *Cajanus cajan* (Nandoto wowuma)
 Nutrients for which no information was found: Pantothenate (ug), Biotine (ug), Iodine (ug), Selenium (ug)



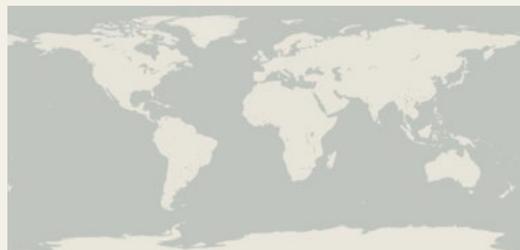
CANAVALIA GLADIATA L.

BOTANICAL INFORMATION

A perennial woody climber growing up to 10 m long but often grown as an annual. Each leaf consists of a leafstalk, 5-17 cm long, and three smaller leaflets which are oval in shape, 7.5-20 cm long, and 5-14 cm wide. The white or purple flowers are 3.5 cm long and the fruit is a pod, 15-40 cm long and 2.5-5 cm wide, containing 8-16 seeds. The seeds are oval in shape, 2-3.5 cm long and 1.5-2 cm wide, and pink, red, brown, or black in color ^[1].

Growth form climber
Life cycle perennial
Centre of origin Asia/Africa

DISTRIBUTION RANGE



Geographic locations where species has been reported to occur

NUTRITIONAL HIGHLIGHTS



● Protein
● Fiber



● Protein
● Fiber



● Protein
● Fiber



ETHNOBOTANICAL INFORMATION

The young pods are eaten as a boiled vegetable. When slightly more ripe, the still green seeds are also eaten after boiling but the pods become too tough to eat. Dry and fully mature seeds should not be eaten as they can be slightly toxic. The flowers and young leaves can also be eaten by steaming them and are mainly used for flavoring. The plant acts as a natural fertilizer by storing nitrogen in the ground and can also be fed to livestock ^[1].

Occurring in farming systems in	Laos
Level of domestication	domesticated
Considered a NUS	yes
Edible parts	fruits, seeds
Contribution to food group(s)	legumes, nuts and seeds
Popular ways of preparation or preservation	boiled, fried or stir-fried

NUTRITIONAL INFORMATION

Nutrition item	Sword bean seeds, sun-dried ^[A]	Sword bean seeds, red, raw ^[B]	Sword bean seeds, brown, raw ^[C]
Protein (grams)	23.33 ●	26.48 ●	32.09 ●
Fiber (grams)	5.39 ●	7.09 ●	8.54 ●
Reference	[2]	[2]	[2]

Nutrition information is indicated per 100g of food plant item.

^[A] Canavalia gladiata (Jacq.) DC, seeds, sun-dried, raw ^[B] Canavalia gladiata, Red, seeds, mature, dried, raw
Nutrients for which no information was found: Energy (kcal), Thiamine (mg), Riboflavin (mg), Niacin (mg NE), Vitamin B6 (mg), Pantothenate (ug), Biotine (ug), Folate (ug DFE), Vitamin C (mg), Vitamin A (ug RAE or RE), Vitamin D (ug), Vitamin E (mg), Vitamin K (ug), Calcium (mg), Magnesium (mg), Zinc (mg), Iron (mg), Iodine (ug), Selenium (ug), Copper (ug), Manganese (ug), Sodium (g), Potassium (mg), Phosphorus (mg)

^[C] Canavalia gladiata, Brown, seeds, mature, dried, raw

CANNA INDICA L.

BOTANICAL INFORMATION

A perennial herb growing up to 3.5 m tall. It has horizontal stems growing underground called rhizomes, which are up to 60 cm long and 10 cm in diameter. The above-ground stem of the plant is fleshy, usually green and purple, and up to 1.5 m tall. The leaves are oval in shape and have a clear line in the middle, are up to 60 cm long and 15-30 cm wide, and grow in a spiral manner around the stem. When blooming, a single flower stalk grows from the stem with several showy flowers at the top. The flowers are brightly red or yellow and up to 6 cm long. The fruit is a round red capsule, 3 cm in diameter, and covered with soft spines. The black seeds are round, smooth, and hard, and 0.5 cm in diameter [2].

Growth form terrestrial herb [2]
Life cycle perennial [2]
Centre of origin South America [2]
Stress Tolerance A hardy plant which can grow in many warm climates and has little pests and diseases [2].

DISTRIBUTION RANGE



Geographic locations where species has been reported to occur

NUTRITIONAL HIGHLIGHTS



● Copper

ETHNOBOTANICAL INFORMATION

African arrowroot produces thick underground stems called rhizomes that are edible when raw but are normally cooked. The rhizomes can also be processed into starch, which is then used for making foods such as noodles. For this, the rhizomes are peeled, dried, and milled. The young shoots of the plant are also edible after cooking, and the leaves of the plant can be used to wrap food. The black seeds are used as beads in jewelry [2]. It is also grown as an ornamental plant.

Occurring in farming systems in	Laos
Level of domestication	wild
Considered a NUS	yes
Edible parts	roots/tubers
Contribution to food group(s)	tubers and roots
Popular ways of preparation or preservation	steamed
Growth place	agricultural field, forest

NUTRITIONAL INFORMATION

Nutrition item	Canna stems, raw
Protein (grams)	0.69
Fiber (grams)	0.64
Niacin (mg NE)	1.03
Vitamin C (mg)	0.61
Calcium (mg)	16.94
Magnesium (mg)	14.74
Zinc (mg)	0.09
Iron (mg)	1.27
Copper (ug)	0.37 ●
Manganese (ug)	0
Sodium (g)	0
Potassium (mg)	107.6
Reference	[3]

Nutrition information is indicated per 100g of food plant item.

Nutrients for which no information was found: Energy (kcal), Thiamine (mg), Riboflavin (mg), Vitamin B6 (mg), Pantothenate (ug), Biotin (ug), Folate (ug DFE), Vitamin A (ug RAE or RE), Vitamin D (ug), Vitamin E (mg), Vitamin K (ug), Iodine (ug), Selenium (ug), Phosphorus (mg)



CAPSICUM FRUTESCENS L.

BOTANICAL INFORMATION

A short-lived perennial shrub with many zig-zagging branches, growing up to 2.5 m tall. The leaves are dark green, oval in shape, 5-12 cm long and 2-5 cm wide. The flowers often grow together in bundles of 2-4 from the base of the leaves. The flowers have five white-green petals and are 6-10 mm in diameter. The shiny fruit is smooth and orange or red in color, often grows upwards, and is 1-2 cm long ^[1].

Growth form shrub ^[1]
Life cycle perennial ^[1]
Centre of origin South America

DISTRIBUTION RANGE



Geographic locations where species has been reported to occur

NUTRITIONAL HIGHLIGHTS



- Protein
- Zinc
- Vitamin C
- Iron
- Magnesium
- Copper

ETHNOBOTANICAL INFORMATION

The fruits of this plant are very spicy and are used to flavor food and to make hot sauces ^[2].

Occurring in farming systems in	Laos
Level of domestication	domesticated
Edible parts	fruits
Contribution to food group(s)	vegetables
Popular ways of preparation or preservation	raw, boiled, fried or stir-fried, dried or dehydrated
Growth place	agricultural field, home garden
Commercialization	yes

NUTRITIONAL INFORMATION

Nutrition item	Chilli pepper, dried ^[A]
Protein (grams)	11.97 ●
Fiber (grams)	1.78
Vitamin B6 (mg)	0.1
Folate (ug DFE)	7.16
Vitamin C (mg)	22.21 ●
Vitamin A (ug RAE or RE)	1.07
Vitamin E (mg)	0.35
Calcium (mg)	106.27
Magnesium (mg)	236.72 ●
Zinc (mg)	32.18 ●
Iron (mg)	67.16 ●
Copper (ug)	17.08 ●
Sodium (g)	0
Potassium (mg)	331.32
Phosphorus (mg)	31.44
Reference	[3]

Nutrition information is indicated per 100g of food plant item.

^[A] Small chilli pepper, dried, grounded

Nutrients for which no information was found: Energy (kcal), Thiamine (mg), Riboflavin (mg), Niacin (mg NE), Pantothenate (ug), Biotine (ug), Vitamin D (ug), Vitamin K (ug), Iodine (ug), Selenium (ug), Manganese (ug)



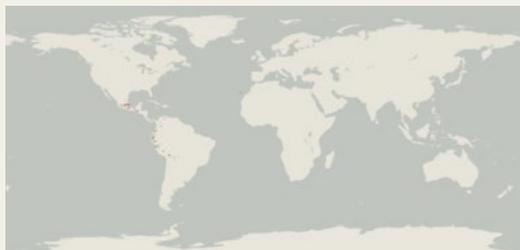
CAPSICUM PUBESCENS L.

BOTANICAL INFORMATION

A perennial shrub or climber that can grow up to 18 m long. The stem is green and purple and the leaves are oval in shape, 5-12 cm long and 2-5 cm wide, and covered with small hairs. The flowers grow alone from the base of the leaves. The flowers have 5-8 purple or sometimes white petals. The shiny fruits are smooth and yellow, orange, red, green, or brown, and contain black seeds ^[1].

Growth form shrub or climber ^[1]
Life cycle perennial ^[1]
Centre of origin Andes ^[1]

DISTRIBUTION RANGE



Geographic locations where species has been reported to occur

NUTRITIONAL HIGHLIGHTS



• Vitamin C

ETHNOBOTANICAL INFORMATION

The fruits of this plant are very spicy and are used to flavor food and to make hot sauces ^[1].

Occurring in farming systems in	Guatemala
Level of domestication	domesticated
Considered a NUS	yes
Edible parts	fruits
Contribution to food group(s)	vegetables
Popular ways of preparation or preservation	raw
Growth place	agricultural field
Commercialization	no

NUTRITIONAL INFORMATION

Nutrition item	Chilli jutiapa ^[A]
Energy (kcal)	37
Protein (grams)	1.1
Thiamine (mg)	0.06
Riboflavin (mg)	0.08
Niacin (mg NE)	2.08
Vitamin C (mg)	36 ●
Calcium (mg)	6
Iron (mg)	0.8
Phosphorus (mg)	20
Reference	[2]

Nutrition information is indicated per 100g of food plant item. ^[A] Chile jutiapa
Nutrients for which no information was found: Fiber (grams), Vitamin B6 (mg), Pantothenate (ug), Biotine (ug), Folate (ug DFE), Vitamin A (ug RAE or RE), Vitamin D (ug), Vitamin E (mg), Vitamin K (ug), Magnesium (mg), Zinc (mg), Iodine (ug), Selenium (ug), Copper (ug), Manganese (ug), Sodium (g), Potassium (mg)



CENTELLA ASIATICA L.

BOTANICAL INFORMATION

A perennial creeping herb with root-like branches that grow on the ground up to 2.5 m long. The leaves are almost round and 1–7 cm in diameter, growing on leafstalks of 1–40 cm. The inconspicuous flowers grow on small stalks above the ground but below the leaves. They often grow with 3 together, have 5 green, pink, or red petals, and are 2–3 mm in diameter. The brown fruits are rather flat and consist of two half-round lobes with many lines on their skin ^[1].

Growth form terrestrial herb ^[1]
Life cycle perennial ^[1]
Centre of origin pantropical
Stress Tolerance Needs damp growing conditions and moist soil ^[1]

DISTRIBUTION RANGE



Geographic locations where species has been reported to occur

NUTRITIONAL HIGHLIGHTS



- Riboflavin
- Vitamin C
- Calcium
- Magnesium
- Iron
- Copper

ETHNOBOTANICAL INFORMATION

Asiatic pennywort grows around the world but is mostly used in Asia. The leaves can be eaten fresh or cooked and are also used to make a drink by mixing them with water and sugar. The leaves are also an important medicine and are used for a wide range of ailments, most importantly skin disorders, wounds, and epilepsy ^[1].

Occurring in farming systems in	Laos
Level of domestication	domesticated
Considered a NUS	yes
Edible parts	leaves
Contribution to food group(s)	vegetables
Popular ways of preparation or preservation	raw
Growth place	home garden, forest, roadside
Commercialization	no

NUTRITIONAL INFORMATION

Nutrition item	Indian pennywort leaves, raw ^[a]
Protein (grams)	3.2
Fiber (grams)	2.4
Thiamine (mg)	0.05
Riboflavin (mg)	0.21 ●
Vitamin C (mg)	23 ●
Calcium (mg)	213 ●
Magnesium (mg)	115 ●
Zinc (mg)	2.04
Iron (mg)	13.1 ●
Copper (ug)	0.37 ●
Potassium (mg)	338
Phosphorus (mg)	34
Reference	[2]

Nutrition information is indicated per 100g of food plant item. ^[a] Indian Pennywort/ Pennywort. leaf. raw
Nutrients for which no information was found: Energy (kcal), Niacin (mg NE), Vitamin B6 (mg), Pantothenate (ug), Biotine (ug), Folate (ug DFE), Vitamin A (ug RAE or RE), Vitamin D (ug), Vitamin E (mg), Vitamin K (ug), Iodine (ug), Selenium (ug), Manganese (ug), Sodium (g)



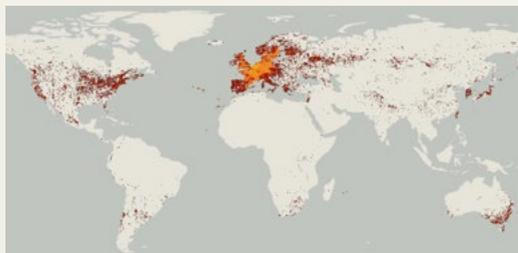
CHENOPODIUM ALBUM L.

BOTANICAL INFORMATION

An annual herb normally grows up to 1.5 m tall, but sometimes to almost 4 m tall, covered with a mealy white or sometimes red-purplish powdery layer. The stem is angular and green or red. The leaves can have different shapes ranging from stretched to round and oval to spearpoint shaped, 1.5-18 cm long and 0.5-18 cm wide. The small flowers grow with many together in bundles at the base of the leaves. The seeds are round, black-brown, and 1-1.8 mm in diameter ^[1].

Growth form terrestrial herb
Life cycle annual
Centre of origin Europe and Central Asia

DISTRIBUTION RANGE



Geographic locations where species has been reported to occur

NUTRITIONAL HIGHLIGHTS



● Vitamin C

● Vitamin A

● Iron



● Vitamin A

● Magnesium

English name
white goosefoot,
pigweed,
lamb's quarter ^[1,2]

Scientific name
Chenopodium album L.

Local names
बेथे · Nepal

Transliterated names
bethe, betuhi · Nepal

ETHNOBOTANICAL INFORMATION

White goosefoot grows around the world in temperate regions and has been harvested for thousands of years. The seeds, young shoots, and leaves are all edible: the leafy parts are cooked as a vegetable and the seeds are boiled, roasted, or made into flour for baking ^[1,2].

Occurring in farming systems in	Nepal
Level of domestication	domesticated
Considered a NUS	yes
Edible parts	whole aerial parts
Contribution to food group(s)	vegetables
Popular ways of preparation or preservation	fried or stir-fried, steamed
Growth place	agricultural field, home garden, forest
Commercialization	no

NUTRITIONAL INFORMATION

Nutrition item	Bethe leaves, raw ^[A]	Bethe leaves and shoots, raw ^[B]
Energy (kcal)	30	20.48
Protein (grams)	3.7	0.97
Fiber (grams)	0.8	
Thiamine (mg)	0.01	0.03
Riboflavin (mg)	0.14	0.03
Niacin (mg NE)	0.6	1.24
Vitamin C (mg)	35 ●	10.17
Vitamin A (ug RAE or RE)	3331 ●	186.38 ●
Calcium (mg)	150	68.68
Magnesium (mg)		75.5 ●
Zinc (mg)		0.41
Iron (mg)	4.2 ●	1.01
Copper (ug)		0.12
Sodium (g)		236.66
Potassium (mg)		426.58
Reference	[3]	[3]

Nutrition information is indicated per 100g of food plant item.

^[A] Bethe leaves ^[B] Lamb's quarters, leaves and shoots, raw

Nutrients for which no information was found: Vitamin B6 (mg), Pantothenate (ug), Biotin (ug), Folate (ug DFE), Vitamin D (ug), Vitamin E (mg), Vitamin K (ug), Iodine (ug), Selenium (ug), Manganese (ug)



CHENOPODIUM PALLIDICAULE L.

BOTANICAL INFORMATION

English name
kaniwa

Scientific name
Chenopodium pallidicaule L.

Local names
cañihua · Peru

A perennial herb with many branches growing 25–60 cm high. The plant can be either green, red, or yellow throughout. The leaves are shaped like an arrowhead. The small flowers grow on the end of the branches with thousands together, producing fruits with a single seed that is 0.5–1.5 mm in diameter ^[1,2].

Growth form terrestrial herb ^[1]
Life cycle annual ^[1]
Centre of origin Andes ^[1]
Stress Tolerance An extremely hardy crop able to grow in frosty, dry, and salty conditions ^[1].

DISTRIBUTION RANGE



Geographic locations where species has been reported to occur

NUTRITIONAL HIGHLIGHTS



- Protein
- Fiber
- Thiamine
- Riboflavin
- Zinc
- Iron
- Phosphorus

ETHNOBOTANICAL INFORMATION

The seeds of kaniwa are edible and often toasted and ground into flour which is then used for baking or to make a porridge. The plant serves as feed for livestock and the ash made from burning the plant is valued for chewing together with coca as it helps to get the narcotic effects from the leaf ^[1,2].

Occurring in farming systems in	Peru
Level of domestication	domesticated
Considered a NUS	yes
Edible parts	seeds
Contribution to food group(s)	legumes, nuts and seeds
Popular ways of preparation or preservation	boiled
Commercialization	yes

NUTRITIONAL INFORMATION

Nutrition item	Kaniwa leaves, raw ^[A]
Energy (kcal)	318
Protein (grams)	14.5 ●
Fiber (grams)	15.5 ●
Thiamine (mg)	0.67 ●
Riboflavin (mg)	0.3 ●
Niacin (mg NE)	1.45
Vitamin C (mg)	0
Calcium (mg)	141
Zinc (mg)	4.55 ●
Iron (mg)	17.07 ●
Phosphorus (mg)	320 ●
Reference	[3]

Nutrition information is indicated per 100g of food plant item. ^[A] Cañihua. hojuelas de
Nutrients for which no information was found: Vitamin B6 (mg), Pantothenate (ug), Biotine (ug), Folate (ug DFE), Vitamin A (ug RAE or RE), Vitamin D (ug), Vitamin E (mg), Vitamin K (ug), Magnesium (mg), Iodine (ug), Selenium (ug), Copper (ug), Manganese (ug), Sodium (g), Potassium (mg)



CHENOPODIUM QUINOA L.

BOTANICAL INFORMATION

An annual herb of 0.7–3 m tall. The stem is round at the base but becomes more angular higher up in the plant and can be either green, yellow, red, purple, or orange, or a combination of these. The lower leaves are more or less diamond-shaped, whereas the leaves higher up on the plant are more shaped like a long arrowhead. The small flowers grow with thousands together at the base of the leaves. The seeds are small and are either translucent, white, brown, or black ^[1].

Growth form terrestrial herb
Life cycle annual ^[1]
Centre of origin Andes ^[1]
Stress Tolerance Quinoa is well adapted to drought but does not tolerate temperatures higher than 35°C or lower than -3°C ^[1].

DISTRIBUTION RANGE



Geographic locations where species has been reported to occur

NUTRITIONAL HIGHLIGHTS



- Protein
- Fiber
- Thiamine
- Riboflavin
- Zinc
- Phosphorus

ETHNOBOTANICAL INFORMATION

Quinoa was a very important plant in the Andes before European colonization and it is nowadays still a widely cultivated food crop. The seeds of the plant are edible and are toasted, ground into flour, or boiled. The leaves can also be eaten, either raw or cooked. The plant as a whole is furthermore used as feed for livestock ^[1].

Occurring in farming systems in	Peru
Level of domestication	domesticated
Considered a NUS	yes
Edible parts	leaves, seeds
Contribution to food group(s)	vegetables; legumes, nuts and seeds
Popular ways of preparation or preservation	boiled, steamed
Commercialization	yes

NUTRITIONAL INFORMATION

Nutrition item	Quinoa, white, raw ^[A]
Energy (kcal)	334
Protein (grams)	12.5 ●
Fiber (grams)	9.98 ●
Thiamine (mg)	0.4 ●
Riboflavin (mg)	0.77 ●
Vitamin C (mg)	0
Vitamin A (ug RAE or RE)	1.55
Calcium (mg)	85
Zinc (mg)	3.54 ●
Iron (mg)	3.03
Phosphorus (mg)	155 ●
Reference	^[2]

Nutrition information is indicated per 100g of food plant item. ^[A] Quinoa, blanca de Junin, raw
Nutrients for which no information was found: Niacin (mg NE), Vitamin B6 (mg), Pantothenate (ug), Biotine (ug), Folate (ug DFE), Vitamin D (ug), Vitamin E (mg), Vitamin K (ug), Magnesium (mg), Iodine (ug), Selenium (ug), Copper (ug), Manganese (ug), Sodium (g), Potassium (mg)



CITRULLUS NAUDINIANUS L.

BOTANICAL INFORMATION

A creeping plant that can grow stems up to 6 m long, which dies off after every growing season. It has a taproot that grows up to 1 m deep. The leaves are 3-18 cm in diameter and deeply lobed. Each plant has either male or female flowers, and fruits will grow only on plants with female flowers. The flowers are yellow-greenish in color, 3-5 cm in diameter, and containing 5 petals. The fruit is a round to oval-shaped berry up to 12 cm in diameter and covered in soft spines. The fruit is green when young and colors into a pale yellow when ripe ^[1].

Growth form creeper
Life cycle perennial ^[1]
Centre of origin southern Africa ^[1]

DISTRIBUTION RANGE



Geographic locations where species has been reported to occur

ETHNOBOTANICAL INFORMATION

The mature juicy fruits of the herero cucumber are eaten raw and can serve as an important source of water in arid areas of southern Africa. The fruits are also sometimes eaten roasted. The fruit peel and seeds can furthermore be made into an edible meal by roasting and pounding them. The poisonous root is used to make arrow poison ^[1].

Occurring in farming systems in	Zambia
Level of domestication	wild
Considered a NUS	yes
Edible parts	fruits; seeds
Contribution to food group(s)	fruits; nuts and seeds
Popular ways of preparation or preservation	raw
Growth place	agricultural field
Commercialization	yes

No nutritional information was found for *Citrullus naudinianus*



CLEOME GYNANDRA L.

BOTANICAL INFORMATION

An annual herb growing up to 150 cm tall, with many branches and many small glands on the stem. Each leaf is composed of a leafstalk, which is 2-10 cm long, and five small leaflets which are more or less oval in shape, each one 2-10 cm long and 1-4 cm wide. Multiple flowers grow together on a stalk of up to 30 cm long at the top of the plant. The flowers have four slender petals, each one up to 1.5 cm long, which are white and sometimes have purple spots. The petals surround a purple stalk on which the 6 stamens and the pistil (the male and the female flower parts) grow. Each stamen is about 1.5 cm long, giving the flower the appearance of a spider with thin legs. The fruit is a thin green or yellow capsule up to 12 cm long and 1 cm wide ^[1].

Growth form: terrestrial herb
 Life cycle: annual
 Centre of origin: Sub-Saharan Africa ^[1]
 Stress Tolerance: Does not tolerate temperatures below 15°C ^[1].

DISTRIBUTION RANGE



Geographic locations where species has been reported to occur

NUTRITIONAL HIGHLIGHTS



- Vitamin B6
- Folate
- Vitamin C
- Vitamin A
- Vitamin E
- Calcium
- Magnesium
- Zinc
- Iron
- Copper
- Manganese
- Potassium
- Protein
- Vitamin C
- Iron

ETHNOBOTANICAL INFORMATION

The young shoots, leaves, and flowers of this plant are all edible. They are often boiled and used in sauces and stews. The leaves are also sometimes dried and ground into powder which can then be stored for later use. The seeds, which have a mustard-like taste, can furthermore be used as a spice. The leaves are used medicinally, among others to treat anemia and rheumatism, whereas the seeds are sometimes used for fishing by throwing them in the water, which will make the fish float. The plant is very useful when planted together with other plants: it has insect-repellent properties and therefore protects other plants from pests ^[1].

Occurring in farming systems in	Zambia	Zimbabwe	Uganda
Level of domestication	semidomesticated	domesticated	semi-domesticated
Considered a NUS	no	yes	yes
Edible parts	leaves	leaves	leaves, stems
Contribution to food group(s)	vegetables	vegetables	vegetables
Popular ways of preparation or preservation	boiled, dried	boiled, fried or stir-fried	boiled
Growth place	agricultural field, home garden, forest, other	agricultural field, home garden, forest, other	agricultural field, home garden, forest, riverside, other
Commercialization	no	yes	yes

NUTRITIONAL INFORMATION

Nutrition item	Cat's whiskers leaves, raw ^[A]	Cat's whiskers leaves, boiled ^[B]
Energy (kcal)	45	89
Protein (grams)	4.8	5.48 ●
Fiber (grams)	1.9	
Thiamine (mg)	0.12	
Riboflavin (mg)	0.14	
Niacin (mg NE)	1.6	
Vitamin B6 (mg)	0.42 ●	
Pantothenate (ug)	0.14	
Biotine (ug)	0.1	
Folate (ug DFE)	415 ●	
Vitamin C (mg)	265 ●	40.43 ●
Vitamin A (ug RAE or RE)	1436 ●	
Vitamin D (ug)	0	
Vitamin E (mg)	2.99 ●	
Calcium (mg)	2210 ●	0.53
Magnesium (mg)	91 ●	
Zinc (mg)	2.6 ●	0.15
Iron (mg)	35.7 ●	6.65 ●
Copper (ug)	0.5 ●	
Manganese (ug)	1918 ●	
Sodium (g)	23	
Potassium (mg)	574 ●	
Phosphorus (mg)	14	
Reference	^[2]	^[3]

Nutrition information is indicated per 100g of food plant item. ^[a] Leaves, cat's whiskers, raw. (Luni) ^[b] Boiled cat's whiskers
 Nutrients for which no information was found: Vitamin K (ug), Iodine (ug), Selenium (ug)



CLEOME HOUTTEANA L.

BOTANICAL INFORMATION

An annual herb growing 90-150 cm tall, with most branches growing at the lower part of the stem and little branches growing higher up on the plant. The branches are light green and are covered in many small hairlike glands. There are two types of leaves on this plant: the lower leaves are 15-20 cm in diameter and are composed of 3-7 small more or less oval pointed leaflets, whereas the leaves higher on the plant are made up of a single leaf that is thin and long. Multiple flowers grow together on a stalk at the top of the plant. The flowers have four petals, which are either purple or white. The petals surround a stalk on which the 6 stamens and the pistil (the male and the female flower parts) grow. The stalk and stamens together are 5-8 cm long, giving the flower the appearance of a spider with thin legs. The fruit is a thin green capsule ^[1].

Growth form terrestrial herb ^[1]
Life cycle annual
Centre of origin South America

DISTRIBUTION RANGE



Geographic locations where species has been reported to occur

ETHNOBOTANICAL INFORMATION

Occurring in farming systems in	Uganda
Level of domestication	domesticated
NUS	yes
Edible parts	leaves
Contribution to food group(s)	vegetables
Popular ways of preparation or preservation	boiled
Commercialization	yes

No nutritional information was found for *Cleome houtteana*



COLOCASIA ESCULENTA L.

BOTANICAL INFORMATION

A perennial herb, but often grown as an annual, that grows up to 1 m tall, with a very large corm (underground stem). The corm is cylindrical, up to 30 cm long and 15 cm wide, and can weigh up to 4 kg. The leaves grow from the corm and branch slightly above ground. The leaves consist of a long leafstalk which can be up to 1 m long and a heart-shaped leaf blade 20–50 cm long. The flower is a typical aroid flower, meaning it has a spathe (a large showing leaf-like structure) growing around a spadix (a stalk containing male and female flower parts). The spathe is yellow and the spadix is yellow to creamy white. The berries are orange and numerous and grow closely together on the end of the stalk after flowering ^[1].

Growth form terrestrial herb
Life cycle perennial
Centre of origin Southeast Asia

DISTRIBUTION RANGE



Geographic locations where species has been reported to occur

NUTRITIONAL HIGHLIGHTS

- 
 - Magnesium
 - Copper
 - Potassium
- 
 - Vitamin C
- 
 - Vitamin C

ETHNOBOTANICAL INFORMATION

Taro has been an important staple food in Asia and the Pacific for millennia. Both the thick starchy underground stems (corms) as well as the leaves and leaf stalks are edible when cooked. The corms are peeled and then fried, boiled, or mashed into puree, whereas the cooked leaves can be used as a vegetable in stews or in salads. In several countries in Asia, the plant also holds an important cultural significance as it is used in ceremonies ^[1].

Occurring in farming systems in	Guatemala	Laos	Nepal
Level of domestication	domesticated	domesticated	domesticated
Considered a NUS	yes	no	yes
Edible parts	roots/tubers	roots/tubers	roots/tubers, whole aerial parts
Contribution to food group(s)	tubers and roots	tubers and roots	tubers and roots; vegetables
Popular ways of preparation or preservation	boiled	boiled, steamed	boiled
Growth place	agricultural field, home garden	agricultural field, home garden	agricultural field, home garden, forest, lake, other
Commercialization	no	no	yes

NUTRITIONAL INFORMATION

Nutrition item	Taro corm, raw ^[A]	Taro leaves, raw ^[B]	Taro leaves, blanched ^[C]
Energy (kcal)	68.17		
Protein (grams)	0.17	3.1	3
Fiber (grams)		1.3	1.8
Thiamine (mg)	0.17		
Riboflavin (mg)	0		
Niacin (mg NE)	0.45		
Vitamin C (mg)	3.62	82.6 ●	43.9 ●
Vitamin A (ug RAE or RE)	0		
Calcium (mg)	92.96		
Magnesium (mg)	51.53 ●		
Zinc (mg)	0.34		
Iron (mg)	0.24		
Copper (ug)	0.18 ●		
Sodium (g)	8.12		
Potassium (mg)	653.39 ●		
Phosphorus (mg)	99.5		
Reference	[2]	[2]	[2]

Nutrition information is indicated per 100g of food plant item.

^[a] Taro. corm. raw. ^[b] Cocoyam. leaves. raw ^[c] Cocoyam. leaves. blanched

Nutrients for which no information was found: Vitamin B6 (mg), Pantothenate (ug), Biotine (ug), Folate (ug DFE), Vitamin D (ug), Vitamin E (mg), Vitamin K (ug), Iodine (ug), Selenium (ug), Manganese (ug)



CORCHORUS OLITORIUS L.

BOTANICAL INFORMATION

An annual herb growing up to 2 m tall with a red-green fibrous stem and many branches. The leaves are roughly oval, 4-15 cm long and 2-5 cm wide, have a toothed leaf edge, and grow on leafstalks 1-7 cm long. The yellow flowers are 1-1.5 cm in diameter, have 5 petals, and grow alone or sometimes with up to three other flowers at the base of the leaves. The fruit is a green cylindrical capsule up to 7 cm long with long lines along its length. Inside the fruit are many dark grey seeds 1-3 mm in diameter ^[1].

Growth form terrestrial herb
 Life cycle annual
 Centre of origin Africa

DISTRIBUTION RANGE



Geographic locations where species has been reported to occur

NUTRITIONAL HIGHLIGHTS



- Fiber
- Calcium
- Magnesium
- Copper
- Potassium



- Vitamin C



- Protein
- Vitamin K
- Zinc
- Iron

ETHNOBOTANICAL INFORMATION

Jute mallow occurs around the world in tropical regions and is used as a leafy vegetable. The fresh or dried leaves, which are sometimes ground into powder, can be cooked to form a slimy sauce. The leaves and stems are also processed to make jute, a fiber, which is practiced commercially in several Asian countries ^[1].

Occurring in farming systems in	Uganda
Level of domestication	semi-domesticated
Considered a NUS	yes
Edible parts	leaves
Contribution to food group(s)	vegetables
Popular ways of preparation or preservation	boiled
Growth place	agricultural field, home garden, forest, roadside
Commercialization	yes

NUTRITIONAL INFORMATION

Nutrition item	Jute leaves, raw ^[A]	Jute leaves, blanched ^[B]	Jute leaves, dried ^[C]
Energy (kcal)			131
Protein (grams)	4.6	1.6	6.44 ●
Fiber (grams)	7.3 ●	2.4	
Thiamine (mg)	0.12		
Vitamin C (mg)		108.7 ●	54.22 ●
Calcium (mg)	423 ●		0.33
Magnesium (mg)	137 ●		
Zinc (mg)	1.79		4.18 ●
Iron (mg)			4.18 ●
Copper (ug)	0.73 ●		
Sodium (g)	11.3		
Potassium (mg)	814 ●		
Phosphorus (mg)	99.7		
Reference	[2]	[2]	[3]

Nutrition information is indicated per 100g of food plant item.

^[A] Indian jute, leaf, raw ^[B] Bush okro, leaves, blanched ^[C] Jute leaves (dry)

Nutrients for which no information was found: Riboflavin (mg), Niacin (mg NE), Vitamin B6 (mg), Pantothenate (ug), Biotine (ug), Folate (ug DFE), Vitamin A (ug RAE or RE), Vitamin D (ug), Vitamin E (mg), Vitamin K (ug), Iodine (ug), Selenium (ug), Manganese (ug)



CORCHORUS TRIDENS L.

BOTANICAL INFORMATION

An annual herb growing up to 1 m tall with a reddish fibrous stem which is sometimes a little woody. The narrow leaves are 2.5-10 cm long and 0.5-3 cm wide, have a toothed leaf edge, and grow on leafstalks of 1.5 cm long. The yellow flowers are 1 cm in diameter, have 5 petals, and grow alone or sometimes with up to three other flowers at the base of the leaves. The fruit is a green to brown cylindrical capsule up to 4 cm long and 2 mm wide, with lines along its length and three small horns at the end. Inside the fruit are many dark brown seeds of 1.5 mm in diameter ^[1].

Growth form terrestrial herb
 Life cycle annual
 Centre of origin Africa

DISTRIBUTION RANGE



Geographic locations where species has been reported to occur

NUTRITIONAL HIGHLIGHTS



● Protein
 ● Calcium
 ● Magnesium



● Iron
 ● Phosphorus

● Calcium
 ● Magnesium

● Iron
 ● Phosphorus

ETHNOBOTANICAL INFORMATION

Jew's mallow occurs in Africa and several South-Asian countries and is used as a leafy vegetable. The leaves, which are more bitter than the closely related jute mallow, are cooked to form a slimy sauce. The stem's fibers are sometimes used to make rough ropes or fishing lines ^[1].

Occurring in farming systems in	Zambia
Level of domestication	semi-domesticated
Considered a NUS	no
Edible parts	leaves, shoots
Contribution to food group(s)	vegetables
Popular ways of preparation or preservation	boiled
Growth place	agricultural field, home garden, forest, roadside
Commercialization	no

NUTRITIONAL INFORMATION

Nutrition item	Wild jute leaves, raw ^[A]	Wild jute leaves, cooked ^[B]
Protein (grams)	5.19 ●	3.82
Riboflavin (mg)	0.07	0.04
Calcium (mg)	585 ●	586 ●
Magnesium (mg)	80.9 ●	74.2 ●
Zinc (mg)	0.8	1.3
Iron (mg)	6.3 ●	6.8 ●
Phosphorus (mg)	136 ●	138 ●
Reference	[2]	[2]

Nutrition information is indicated per 100g of food plant item.

^[a] Wild jute. leaves. raw ^[b] Wild jute. leaves. cooked

Nutrients for which no information was found: Energy (kcal), Fiber (grams), Thiamine (mg), Niacin (mg NE), Vitamin B6 (mg), Pantothenate (ug), Biotine (ug), Folate (ug DFE), Vitamin C (mg), Vitamin A (ug RAE or RE), Vitamin D (ug), Vitamin E (mg), Vitamin K (ug), Iodine (ug), Selenium (ug), Copper (ug), Manganese (ug), Sodium (g), Potassium (mg)



CROTALARIA LONGIROSTRATA L.

BOTANICAL INFORMATION

An annual herb about 0.6 m high that sometimes lives for multiple years and can then develop into a shrub of up to 1.8 m high. The stem is dark red and the branches are slender and grow mainly vertically. Each leaf consists of a leafstalk of 1.8 cm long and three smaller leaflets, which are roughly oval in shape and 1.3-4 cm long. The underside of the leaves is pale. The flowers are yellow with a few red-brown spots, 2.5 cm long, and grow together with 15-20 other flowers at the top of the branches. The fruits are shaped like bean pods, are brown when ripe, and contain 4-6 light to dark brown seeds of about 3 mm in diameter ^[1].

Growth form: terrestrial herb
 Life cycle: annual
 Centre of origin: Central America

DISTRIBUTION RANGE



Geographic locations where species has been reported to occur

NUTRITIONAL HIGHLIGHTS



- Protein
- Fiber
- Thiamine
- Riboflavin

- Vitamin C
- Vitamin A
- Calcium
- Iron



- Fiber
- Magnesium
- Phosphorus

ETHNOBOTANICAL INFORMATION

Chipilin is eaten in several countries in Central America. The young shoots, leaves, and flowers can all be eaten after cooking, and when they are eaten in large quantities they have a narcotic effect, leading to a deep sleep. The young leaves can also be eaten raw and are sometimes used in small quantities to flavor a dish. However, too much of the raw leaves can cause vomiting. The seeds and roots are poisonous and should not be eaten ^[1].

Occurring in farming systems in	Guatemala
Level of domestication	domesticated
Considered a NUS	yes
Edible parts	leaves, flower
Contribution to food group(s)	vegetables
Popular ways of preparation or preservation	boiled
Growth place	agricultural field, home garden, other
Commercialization	yes

NUTRITIONAL INFORMATION

Nutrition item	Chipilin, leaves and tips, raw ^[A]	Chipilin, tamalito, cooked ^[B]
Energy (kcal)	56	204
Protein (grams)	7 ●	4.04
Fiber (grams)	3.24 ●	4.92 ●
Thiamine (mg)	0.33 ●	0.18
Riboflavin (mg)	0.49 ●	0.06
Niacin (mg NE)	2	0.83
Vitamin B6 (mg)		0
Vitamin C (mg)	100 ●	3
Vitamin A (ug RAE or RE)	667 ●	34
Calcium (mg)	287 ●	14
Magnesium (mg)		58 ●
Zinc (mg)		0.01
Iron (mg)	4.7 ●	1.14
Sodium (g)		128
Potassium (mg)		114
Phosphorus (mg)	72	118 ●
Reference	[2]	[2]

Nutrition information is indicated per 100g of food plant item.

^[A] Chipilin. hojas y punta ^[B] Tamalito de chipilin (Guatemala)

Nutrients for which no information was found: Pantothenate (ug), Biotine (ug), Folate (ug DFE), Vitamin D (ug), Vitamin E (mg), Vitamin K (ug), Iodine (ug), Selenium (ug), Copper (ug), Manganese (ug)



CROTALARIA RETUSA L.

BOTANICAL INFORMATION

An annual herb growing up to 1.2 m tall. The leaves have a thin oval shape, with the part of the leaves that is attached to the stem getting increasingly thinner closer to the branch, hence the name wedge-leaf. The leaves are 3-10 cm long and 1-4 cm wide. The flowers are yellow with sometimes some purple spots, about 2.5 cm long, and grow together at the top of the plant in a spike-like structure of 15-30 cm long. The fruits are shaped like bean pods, 2.5-5 cm long and 1-2 cm wide, and contain 15-20 seeds. The seeds are shaped like a heart, up to 5 mm in diameter, and yellow-brown to black in color ^[1].

Growth form: terrestrial herb
 Life cycle: annual
 Centre of origin: Asia, Africa

DISTRIBUTION RANGE



Geographic locations where species has been reported to occur

NUTRITIONAL HIGHLIGHTS



- Protein
- Fiber
- Calcium
- Magnesium
- Zinc

- Iron
- Copper
- Potassium
- Phosphorus



- Protein
- Fiber
- Calcium
- Magnesium
- Iron
- Potassium
- Phosphorus

ETHNOBOTANICAL INFORMATION

The sweet leaves and flowers of devil bean are eaten after cooking. The plant is also used to make fibres and it grown as a green manure, as it enriches the soil with nitrogen. Devil bean is poisonous to livestock ^[1].

Occurring in farming systems in	Uganda
Level of domestication	domesticated
Considered a NUS	yes
Edible parts	leaves
Contribution to food group(s)	vegetables
Popular ways of preparation or preservation	boiled
Growth place	home garden, other
Commercialization	no

NUTRITIONAL INFORMATION

Nutrition item	Seeds, dried, grinded ^[A]	Leaves, dried ^[B]	Seeds, dried, milled ^[C]
Energy (kcal)	205		
Protein (grams)	4.37	18 ●	14.63 ●
Fiber (grams)	37.5 ●	16.75 ●	20.4 ●
Calcium (mg)		580 ●	780 ●
Magnesium (mg)		480 ●	640 ●
Zinc (mg)	3.02 ●		
Iron (mg)	3	7.61 ●	7.01 ●
Selenium (ug)	0.01		
Copper (ug)	12.84 ●		
Sodium (g)	0		
Potassium (mg)	1	970 ●	680 ●
Phosphorus (mg)		370 ●	470 ●
Reference	[2]	[3]	[3]

Nutrition information is indicated per 100g of food plant item.

^[A] Seeds, dried, grinded ^[B] Leaves, dried, ^[C] Seeds, dried, milled

Nutrients for which no information was found: Thiamine (mg), Riboflavin (mg), Niacin (mg NE), Vitamin B6 (mg), Pantothenate (ug), Biotine (ug), Folate (ug DFE), Vitamin C (mg), Vitamin A (ug RAE or RE), Vitamin D (ug), Vitamin E (mg), Vitamin K (ug), Iodine (ug), Manganese (ug)



CUCUMIS ANGURIA L.

BOTANICAL INFORMATION

An annual creeping plant with grooved stems, short stiff hairs, and tendrils of 3-6 cm long. The leaves are covered in bristly hairs on both sides and deeply lobed and are 3-12 cm in diameter. The yellow flowers have 5 petals and are 1-1.5 cm in diameter. The fruits, which are green when young and yellow when ripe, are round to oval in shape, 3-4.5 cm long and 2-3.5 cm wide, covered in soft spines, and grow on a stalk of 2.5-21 cm long ^[1].

Growth form creeper
Life cycle annual
Centre of origin Sub-Saharan Africa

DISTRIBUTION RANGE



Geographic locations where species has been reported to occur

English name
West Indian gherkin,
bur cucumber,
gooseberry gourd ^[1]

Scientific name
Cucumis anguria L.

Local names
muferefere - Zimbabwe

ETHNOBOTANICAL INFORMATION

There are several varieties of West Indian gherkin, including those with bitter and non-bitter fruits. Seeds from this plant were brought from Africa to the Americas with the slave trade, where they were domesticated into a non-bitter variety. This variety in turn was reintroduced into Africa where it is now grown for its fruits. The immature fruits of the non-bitter variety are pickled or eaten fresh and ripe fruits are used as vegetables in sauces and soups. The leaves of bitter types are also edible after cooking. The fruit juice from bitter varieties is furthermore used to treat wounds in livestock and can be used as a natural pesticide to prevent pests from eating stored crops ^[1].

Occurring in farming systems in	Zimbabwe
Level of domestication	semi-domesticated
Considered a NUS	yes
Edible parts	leaves, fruits
Contribution to food group(s)	vegetables
Popular ways of preparation or preservation	boiled, fried or stir-fried
Growth place	agricultural field, home garden
Commercialization	no

No nutritional information was found for *Cucumis anguria*



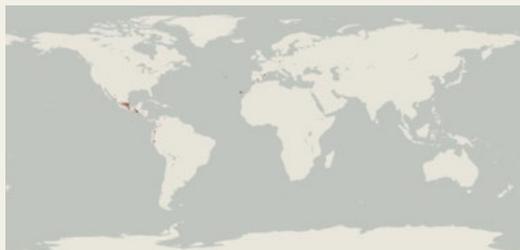
CUCURBITA FICIFOLIA L.

BOTANICAL INFORMATION

A short-lived perennial climber that is mostly herbaceous but can become a little woody, with long tendrils and a prickly stem. The leaves are oval to kidney-shaped and 18-25 cm in diameter. The flowers are yellow to pale orange, have 5 petals, and are up to 7.5 cm in diameter. The fruit is round to oval, 15-50 cm long, and green with white stripes and dots. The black seeds are flat, oval in shape, and 1.5-2.5 cm long ^[1].

Growth form	climber
Life cycle	perennial
Centre of origin	Central and South America
Stress Tolerance	Fig-leaf gourd is more resistant to pests and diseases than other Cucurbita species ^[1] .

DISTRIBUTION RANGE



Geographic locations where species has been reported to occur



Cucurbita ficifolia

ETHNOBOTANICAL INFORMATION

The large fruits of this gourd can be eaten both ripe or when still immature. The unripe fruits are eaten raw or boiled and used in stews. The ripe fruits can be fermented into an alcoholic drink or cubed and covered with sugar to make candy or jam. The young leaves, shoots, flowers, and seeds can also all be eaten. The whole seeds including their husks are a medicine against intestinal parasites ^[1].

Occurring in farming systems in	Guatemala
Level of domestication	domesticated
Considered a NUS	yes
Edible parts	fruits, meristems
Contribution to food group(s)	fruits, vegetables
Popular ways of preparation or preservation	boiled
Growth place	agricultural field, home garden
Commercialization	yes

NUTRITIONAL INFORMATION

Nutrition item	Malabar gourd, raw
Fiber (grams)	1.1
Calcium (mg)	134
Magnesium (mg)	32
Iron (mg)	2
Potassium (mg)	186
Phosphorus (mg)	54
Reference	[2]

Nutrition information is indicated per 100g of food plant item.

Nutrients for which no information was found: Energy (kcal), Protein (grams), Thiamine (mg), Riboflavin (mg), Niacin (mg NE), Vitamin B6 (mg), Pantothenate (ug), Biotine (ug), Folate (ug DFE), Vitamin C (mg), Vitamin A (ug RAE or RE), Vitamin D (ug), Vitamin E (mg), Vitamin K (ug), Zinc (mg), Iodine (ug), Selenium (ug), Copper (ug), Manganese (ug), Sodium (g)

CUCURBITA MAXIMA L.

BOTANICAL INFORMATION

An annual climbing herb with 2-5 branched tendrils and long, softly-haired round stems. The leaves are kidney-shaped and not much lobed, 7-25 cm in diameter, and grow on a leaf stalk of 10-20 cm long. The flowers are yellow to orange in color, have 5 petals, and are 10-20 cm in diameter. The fruit is round and comes in many colors and sizes: some Cucurbita maxima pumpkins can grow up to 50 kg and most pumpkins are yellow to orange. The fruit of C. maxima grows on a soft round fruit stalk that is not widened near the fruit. The seeds are white to pale brown, flat and oval in shape, 1.5-2.5 cm long and 1-1.5 cm wide ^[1].

Growth form climber, creeper
Life cycle annual
Centre of origin South America ^[1]

DISTRIBUTION RANGE



Geographic locations where species has been reported to occur

NUTRITIONAL HIGHLIGHTS



- Protein
- Vitamin A
- Vitamin E

- Magnesium
- Copper
- Manganese



- Vitamin A
- Vitamin E
- Manganese



ETHNOBOTANICAL INFORMATION

There are many different varieties and species of Cucurbita that are called pumpkin and all are used similarly. The leaves, flowers, fruits, and seeds of pumpkins are all edible. The ripe fruit is peeled and the inside is cooked and used in stews or soups. The seeds are roasted or ground into a paste that is mixed with other vegetables and the leaves are cooked as a leafy vegetable. The hard shells of the fruits can be used to make bowls and the seeds are used as medicine against intestinal parasites ^[1].

Occurring in farming systems in	Guatemala	Zimbabwe	Uganda
Level of domestication	domesticated	domesticated	semi-domesticated
Considered a NUS	no	no	yes
Edible parts	stems, leaves, flowers, fruits, seeds, stalk of flower	leaves, fruits, seeds	fruits
Contribution to food group(s)	vegetables, fruits; legumes nuts and seeds	vegetables; legumes nuts and seeds	vegetables
Popular ways of preparation or preservation	boiled, fried or stir-fried (leaves), steamed (leaves), dried (leaves)	boiled, fried or stir-fried	boiled
Growth place	agricultural land, home garden, forest, roadside, other	agricultural land, home garden	agricultural land, home garden, forest
Commercialization	yes	no	yes

NUTRITIONAL INFORMATION

Nutrition item	Pumpkin leaves, boiled ^[A]	Pumpkin, boiled ^[B]
Energy (kcal)	47	60
Protein (grams)	5.2	2
Fiber (grams)	1 ●	1.5
Thiamine (mg)	0	0.07
Riboflavin (mg)	0.11	0.04
Niacin (mg NE)		0.7
Vitamin B6 (mg)		0.15
Folate (ug DFE)	47	9
Vitamin C (mg)	0	10
Vitamin A (ug RAE or RE)	485 ●	189 ●
Vitamin D (ug)	0	0
Vitamin E (mg)	2.17 ●	2.04 ●
Calcium (mg)	142	35
Magnesium (mg)	75 ●	32
Zinc (mg)	0.7	0.2
Iron (mg)	2.2	2
Copper (ug)	0.2 ●	0.1
Manganese (ug)	1230 ●	30 ●
Sodium (g)	0	8
Potassium (mg)	170	358
Phosphorus (mg)	82	44
Reference	[2]	[2]

Nutrition information is indicated per 100g of food plant item.

^[A] Leaves, pumpkin, boiled. (Nkhwani wowilita) ^[B] Pumpkin, boiled. (Dzungu lowiritisa)

Nutrients for which no information was found: Pantothenate (ug), Biotine (ug), Vitamin K (ug), Iodine (ug), Selenium (ug)

CUCURBITA MOSCHATA L.

BOTANICAL INFORMATION

An annual climbing herb with 3-4 branched tendrils and long, softly-haired, and grooved stems. The leaves are kidney-shaped and shallowly lobed, 20-35 cm in diameter, and grow on a leaf stalk of 9-24 cm long. The flowers are yellow to orange in color, have 5 petals, and are 10-20 cm in diameter. The fruit is round and comes in many colors and sizes: some Cucurbita moschata pumpkins can grow up to 10 kg and most have green spots and grey stripes. The fruit of C. moschata grows on a hard-angled fruit stalk that is widened near the fruit. The seeds are white to pale brown, flat and oval in shape, 1-2 cm long and 0.5-1 cm wide ^[1].

Growth form climber, creeper ^[1]
 Life cycle annual
 Centre of origin South America ^[1]

DISTRIBUTION RANGE



Geographic locations where species has been reported to occur

NUTRITIONAL HIGHLIGHTS

● Copper ● Vitamin A



ETHNOBOTANICAL INFORMATION

There are many different varieties and species of Cucurbita that are called pumpkin and all are used in a similar way. The leaves, flowers, fruits, and seeds of pumpkins are all edible. The ripe fruit is peeled and the inside is cooked and used in stews or soups. The seeds are roasted or ground into a paste that is mixed with other vegetables and the leaves are cooked as a leafy vegetable. The hard shells of the fruits can be used to make bowls and the seeds are used as medicine against intestinal parasites ^[1].

Occurring in farming systems in	Guatemala	Laos
Level of domestication	domesticated	domesticated
Considered a NUS	yes	no
Edible parts	leaves, fruits, shoots, seeds	leaves, flowers, fruits
Contribution to food group(s)	vegetables, legumes, nuts and seeds	vegetables
Popular ways of preparation or preservation	boiled	boiled, steamed
Growth place	agricultural field, home garden, roadside	agricultural field, home garden
Commercialization	no	no

NUTRITIONAL INFORMATION

Nutrition item	Pumpkin leaves and tips, raw ^[A]	Pumpkin fruit, raw ^[B]
Vitamin A (ug RAE or RE)		272 ●
Zinc (mg)	0.65	
Copper (ug)	0.16 ●	
Manganese (ug)	0	
Reference	[2]	[2]

Nutrition information is indicated per 100g of food plant item.

^[A] Pumpkin leaf tips, raw ^[B] Squash fruit, Menina verde, raw

Nutrients for which no information was found: [list deleted nutrients that are empty for all three columns]

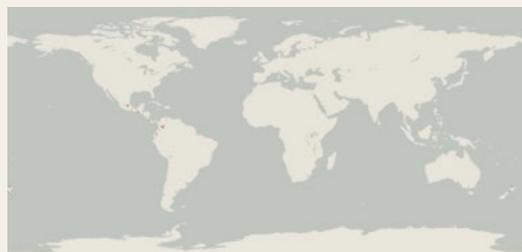
DAHIA IMPERIALIS L.

BOTANICAL INFORMATION

A perennial shrub that grows up to 5 m high with green or red stems. The plant has leaves that are shaped like a feather, with one main leaf rib of about 60-90 cm long, from which up to 15 smaller leaflets grow. The leaflets are roughly oval with a pointy tip and have a toothed leaf edge. The flowers, which are up to 15 cm in diameter, have many pink-purple petals and are yellow on the inside ^[1].

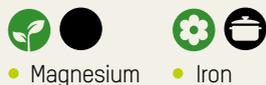
Growth form shrub
Life cycle perennial ^[1]
Centre of origin Central America

DISTRIBUTION RANGE



Geographic locations where species has been reported to occur

NUTRITIONAL HIGHLIGHTS



● Magnesium ● Iron

ETHNOBOTANICAL INFORMATION

The young leaves of this plant are edible and are eaten fried or cooked in soups. The leaves are also fed to livestock. The sap from the stems is drunk to treat infections of the urinary tract ^[1].

Occurring in farming systems in	Guatemala
Level of domestication	wild
Considered a NUS	yes
Edible parts	leaves and flowers
Contribution to food group(s)	vegetables
Popular ways of preparation or preservation	boiled
Growth place	agricultural field, home garden, forest, roadside, riverside, other
Commercialization	yes

NUTRITIONAL INFORMATION

Nutrition item	Bell tree dahlia, raw	Bell tree dahlia, cooked
Energy (kcal)		50
Protein (grams)	3.9	4.9
Fiber (grams)	1.1	1.6
Calcium (mg)	101	109
Magnesium (mg)	49 ●	33
Iron (mg)	1	4 ●
Potassium (mg)	221	94
Phosphorus (mg)	58	55
Reference	[2]	[2]

Nutrition information is indicated per 100g of food plant item.

Nutrients for which no information was found: Thiamine (mg), Riboflavin (mg), Niacin (mg NE), Vitamin B6 (mg), Pantothenate (ug), Biotine (ug), Folate (ug DFE), Vitamin C (mg), Vitamin A (ug RAE or RE), Vitamin D (ug), Vitamin E (mg), Vitamin K (ug), Zinc (mg), Iodine (ug), Selenium (ug), Copper (ug), Manganese (ug), Sodium (g), Potassium (mg), Phosphorus (mg)



DIOSCOREA ALATA L.

BOTANICAL INFORMATION

An annual climbing herb growing up to 10 m tall. Each plant has one thick tuber growing underground, which can vary greatly in size and shape. The outside of the tuber is brown to black and the inside is white or purple. The green to purple stem twines to the right. Older stems are often quadrangular in shape, meaning that they have 4 sides, which makes the stem have a square shape when cut. The leaves are positioned in pairs on the stem and grow opposite of each other. The leaves grow on leafstalks that are as long as the leaf blades, which are shaped like a heart and are 10–30 cm long and 5–20 cm wide with 5 clear lines that run from the base to the tip. Only some plants make flowers and fruits. The small green flowers grow with many together on a single stalk along the length of the plant. The fruits are 2.5–3.5 cm long and have three sides, with the edges sticking out, almost like wings. Propagates mainly vegetatively ^[1].

Growth form	climber
Life cycle	annual
Centre of origin	South East Asia
Stress Tolerance	Greater yam needs at least 1000 mm of rain a year distributed over at least 6 months ^[1] .

DISTRIBUTION RANGE



Geographic locations where species has been reported to occur

NUTRITIONAL HIGHLIGHTS



- Copper
- Potassium

ETHNOBOTANICAL INFORMATION

The tubers of the greater yam are an important staple crop throughout the tropical world. The starchy tubers are cooked and then eaten, for example in stews, but they can also be processed into a variety of food products, including flour, flakes, and ice cream ^[1].

Occurring in farming systems in	Laos
Level of domestication	wild
Considered a NUS	yes
Edible parts	roots/tubers
Contribution to food group(s)	tubers and roots
Popular ways of preparation or preservation	boiled, fried or stir-fried, steamed

NUTRITIONAL INFORMATION

Nutrition item	Yam, raw	Yam, peeled, boiled
Energy (kcal)		98
Protein (grams)		2.3
Calcium (mg)	5	
Magnesium (mg)	22	
Zinc (mg)	0.25	
Copper (ug)	0.14 ●	
Manganese (ug)	0	
Sodium (g)	0	
Potassium (mg)	572 ●	
Phosphorus (mg)	53	
Reference	[2]	[2]

Nutrition information is indicated per 100g of food plant item.

Nutrients for which no information was found: Fiber (grams), Thiamine (mg), Riboflavin (mg), Niacin (mg NE), Vitamin B6 (mg), Pantothenate (ug), Biotine (ug), Folate (ug DFE), Vitamin C (mg), Vitamin A (ug RAE or RE), Vitamin D (ug), Vitamin E (mg), Vitamin K (ug), Iron (mg), Iodine (ug), Selenium (ug)



DIOSCOREA BULBIFERA L.

BOTANICAL INFORMATION

A perennial climber that is often grown as an annual when cultivated, growing up to 6 m tall. Most plants have a thick tuber growing underground which is covered with thick short roots. The stem twines to the left and is roughly round. The leaves grow spread along the stem. The leaves grow on leafstalks that are half as long as the leaf blades, which are shaped like a heart and are up to 20 cm long and 20 cm wide. At the base of the leaves are bulbils, which are plant structures that look like small tubers. The bulbils are warty when small but often smooth when bigger, are round to the kidney, and have a diameter of 2.5-5 cm. They usually weigh about 0.5 kg but can sometimes weigh up to 2 kg. On the inside the bulbils are pale yellow with purple dots and they turn orange when left for a while after cutting. The small flowers are pink-green to white and grow up to 100 together on stalks that hang down. The fruits are 2 cm long and 1 cm wide and have three sides, with the edges sticking out, almost like wings ^[1].

Growth form climber
 Life cycle perennial
 Centre of origin Africa and/or Asia

DISTRIBUTION RANGE



Geographic locations where species has been reported to occur

NUTRITIONAL HIGHLIGHTS

-  ● Copper
-  ● Potassium
-  ● Vitamin C
-  ● Copper



ETHNOBOTANICAL INFORMATION

The name aerial yam refers to the bulbils, which are tuber-like structures (yams) that grow along the length of the plant above the ground. The bulbils of wild species need to be peeled, cut into smaller pieces, soaked, washed, and boiled for a long time to remove the toxins so that they can be eaten. The bulbils have a bitter taste. Most aerial yams also grow tubers underground, which are edible in cultivars but often a little poisonous in wild plants ^[1]. In some parts of the world it has been classified as an invasive weed.

Occurring in farming systems in	Nepal
Level of domestication	wild
Considered a NUS	yes
Edible parts	roots/tubers
Contribution to food group(s)	tubers and roots
Popular ways of preparation or preservation	boiled
Growth place	agricultural field, home garden, forest
Commercialization	no

NUTRITIONAL INFORMATION

Nutrition item	Aerial yam, raw ^[A]	Aerial yam, cooked ^[B]
Protein (grams)	3.3	1.6
Fiber (grams)	1	
Thiamine (mg)	0.13	0.02
Riboflavin (mg)	0.01	
Niacin (mg NE)	0.28	
Vitamin C (mg)	7.7	233 ●
Calcium (mg)	15.5	2
Magnesium (mg)	32.8	7
Zinc (mg)	0.42	0.2
Iron (mg)	1.25	0.8
Copper (ug)	0.26 ●	0.2 ●
Sodium (g)	2.93	
Potassium (mg)	547 ●	138
Phosphorus (mg)	77.3	
Reference	[2]	[2]

Nutrition information is indicated per 100g of food plant item.

^[A] Air potato. fruit flesh. raw ^[B] Cheeky yam. cooked

Nutrients for which no information was found: Vitamin B6 (mg), Pantothenate (ug), Biotine (ug), Folate (ug DFE), Vitamin A (ug RAE or RE), Vitamin D (ug), Vitamin E (mg), Vitamin K (ug), Iodine (ug), Selenium (ug), Manganese (ug)

DIOSCOREA DELTOIDEA L.

BOTANICAL INFORMATION

English name
wild yam

Scientific name
Dioscorea deltoidea L.

Local names
भ्याकुर · Nepal

Transliterated names
bhyakur · Nepal

A perennial climbing herb growing up to 3 m high. The tubers are irregularly shaped, resembling the roots of ginger, and are slightly woody. The stem twines to the right and is purple to brown in color. The leaves grow spread along the stem. The leaves are shaped like a heart, are 5-11 cm long and 4-10 cm wide, and grow on leafstalks 5-10 cm long. The small flowers are green and grow together on stalks that are sometimes branched and are up to 25 cm long. The fruits are green to purple-brown, up to 20 mm long and 14 mm wide, with the edges sticking out, almost like wings ^[1].

Growth form climber ^[1]
Life cycle perennial ^[1]
Centre of origin Asia ^[2]

DISTRIBUTION RANGE



Geographic locations where species has been reported to occur



ETHNOBOTANICAL INFORMATION

The tubers of this wild yam are edible. They are cut into pieces, washed, and then boiled or baked before they can be eaten. The tuber is also used to make soap, which is used for washing hair and killing lice. The plant is furthermore used to treat several gastrointestinal and urogenital diseases ^[1,2,3,4].

Occurring in farming systems in	Nepal
Level of domestication	wild
Considered a NUS	yes
Edible parts	roots/tubers
Contribution to food group(s)	tubers and roots
Popular ways of preparation or preservation	boiled
Growth place	forest
Commercialization	no

NUTRITIONAL INFORMATION

Nutrition item	Wild yam, fresh, raw ^[A]	Wild yam, raw ^[B]
Energy (kcal)	77.8	
Protein (grams)	1.6	1.6
Fiber (grams)	1.5	1.5
Calcium (mg)		46.9
Magnesium (mg)		22.8
Zinc (mg)		0.22
Iron (mg)		1.85
Copper (ug)		0.1
Manganese (ug)		0
Sodium (g)		0
Potassium (mg)		340
Phosphorus (mg)		33.1
Reference	[5]	[6]

Nutrition information is indicated per 100g of food plant item. ^[a] Tubers, fresh. ^[b] Tubers, raw
Nutrients for which no information was found: Thiamine (mg), Riboflavin (mg), Niacin (mg NE), Vitamin B6 (mg), Pantothenate (ug), Biotine (ug), Folate (ug DFE), Vitamin C (mg), Vitamin A (ug RAE or RE), Vitamin D (ug), Vitamin E (mg), Vitamin K (ug), Selenium (ug)

DIOSCOREA HIRTIFLORA L.

BOTANICAL INFORMATION

A perennial climbing herb growing up to 6 m high. The young leaves, shoots, and flowers are densely covered with small hairs. Each plant has 1–6 tubers that can grow up to 5 cm in diameter. The stem twines to the right. The leaves are shaped like a heart and often grow in pairs placed opposite of each other on the stem. The small flowers are green or white and grow with many together on stalks. The fruits are 1–2 cm long and 2.5–3.5 cm wide and have three sides, with the edges sticking out, almost like wings. Mainly propagates vegetatively^[1].

Growth form climber
Life cycle perennial
Centre of origin Africa

DISTRIBUTION RANGE



Geographic locations where species has been reported to occur

NUTRITIONAL HIGHLIGHTS



• Iron

• Iron

ETHNOBOTANICAL INFORMATION

The tubers of this yam are collected from the wild and are edible^[2].

Occurring in farming systems in	Zambia
Level of domestication	wild
Considered a NUS	yes
Edible parts	roots and tubers
Contribution to food group(s)	tubers and roots
Popular ways of preparation or preservation	raw, boiled
Growth place	home garden, forest, roadside
Commercialization	no

NUTRITIONAL INFORMATION

Nutrition item	Busala, raw	Busala, boiled
Energy (kcal)	358	167
Protein (grams)	4.15	3.41
Vitamin C (mg)	0.59	1.12
Calcium (mg)	0.4	0.45
Zinc (mg)	0.42	0.42
Iron (mg)	8.87 ●	7.88 ●
Reference	[3]	[3]

Nutrition information is indicated per 100g of food plant item.

Nutrients for which no information was found: Fiber (grams), Thiamine (mg), Riboflavin (mg), Niacin (mg NE), Vitamin B6 (mg), Pantothenate (ug), Biotin (ug), Folate (ug DFE), Vitamin A (ug RAE or RE), Vitamin D (ug), Vitamin E (mg), Vitamin K (ug), Magnesium (mg), Iodine (ug), Selenium (ug), Copper (ug), Manganese (ug), Sodium (g), Potassium (mg), Phosphorus (mg)



DIOSCOREA VILLOSA L.

BOTANICAL INFORMATION

A perennial climber growing up to 7 m high. The features of this plant are highly variable. The plant's tubers are 0.5-1.5 cm in diameter. The leaves are 3-13 cm long and 2-13 cm wide, shaped like a heart, and grow sometimes alone, sometimes in pairs, and sometimes with several together around the stem. The small flowers are greenish white, 1-4 mm in diameter, and grow with several together on a stalk of 2-30 cm long. The fruits are greenish gold, 1-3 cm long and 1-3.5 cm wide, and have three sides, with the edges sticking out, almost like wings^[1,5].

Growth form climber
Life cycle perennial^[2]
Centre of origin Eastern North America^[2]

DISTRIBUTION RANGE



Geographic locations where species has been reported to occur

NUTRITIONAL HIGHLIGHTS



- Fiber
- Vitamin E

ETHNOBOTANICAL INFORMATION

The tubers of this yam are edible^[3]. The plant is however most often used as a medicine to treat rheumatism, gallstones, and stomach and menstrual cramps^[4].

Occurring in farming systems in	Zambia	Uganda
Level of domestication	wild	semi-domesticated
Considered a NUS	yes	yes
Edible parts	roots/tubers	roots/tubers
Contribution to food group(s)	tubers and roots	tubers and roots
Popular ways of preparation or preservation	boiled	boiled
Growth place	forest, roadside	agricultural field, home garden, forest, lake, riverside
Commercialization	no	yes

NUTRITIONAL INFORMATION

Nutrition item	Wild yam, fresh, pilled ^[4]
Protein (grams)	2.21
Fiber (grams)	3.5 ●
Thiamine (mg)	0.11
Riboflavin (mg)	
Niacin (mg NE)	0.82
Vitamin C (mg)	0.99
Vitamin A (ug RAE or RE)	1.75
Vitamin E (mg)	2.63 ●
Calcium (mg)	145.33
Magnesium (mg)	9.47
Zinc (mg)	0.26
Manganese (ug)	0
Sodium (g)	0
Potassium (mg)	145.33
Phosphorus (mg)	43.82
Reference	[6]

Nutrition information is indicated per 100g of food plant item. ^[4] Edible wild yam. fresh. pilled
Nutrients for which no information was found: Energy (kcal), Riboflavin (mg), Vitamin B6 (mg), Pantothenate (ug), Biotine (ug), Folate (ug DFE), Vitamin D (ug), Vitamin K (ug), Iron (mg), Iodine (ug), Selenium (ug), Copper (ug)



DIPLAZIUM ESCULENTUM L.

BOTANICAL INFORMATION

A perennial herb growing up to 2.5 m high. The stem grows up to 1 m high above the ground. The lower part of the stem is covered with dark string-like roots and the upper part of the stem is covered in brown scales of 1 cm long and 1 mm wide. The leaves are composed of one main leafstalk up to 1.5 m long, from which smaller leafstalks grow on which the green leaflets grow. The largest leaflets are up to 15 cm long and 4 cm wide and have toothed edges. Ferns do not have flowers, fruits, or seeds, but produce spores from which new plants grow. The spores are produced on the underside of the leaves ^[1].

Growth form terrestrial herb
Life cycle perennial
Centre of origin South East Asia

DISTRIBUTION RANGE



Geographic locations where species has been reported to occur

NUTRITIONAL HIGHLIGHTS



- Protein
- Fiber
- Vitamin C
- Iron

ETHNOBOTANICAL INFORMATION

The young leaves are eaten raw in salads, or boiled or steamed as a leafy vegetable, which has a slimy texture and a sweet taste. The edible fern is the most commonly eaten fern in the world. The leaves are also used for a number of medicinal purposes and the leaves are rubbed on the body to get rid of the smell of sweat ^[1].

Occurring in farming systems in	Laos
Level of domestication	wild
Considered a NUS	yes
Edible parts	leaves
Contribution to food group(s)	vegetables
Popular ways of preparation or preservation	boiled
Growth place	agricultural field, forest, riverside
Commercialization	no

NUTRITIONAL INFORMATION

Nutrition item	Fern leaves, sun-dried, grinded ^[A]
Energy (kcal)	324.13
Protein (grams)	52.31 ●
Fiber (grams)	17.44 ●
Vitamin C (mg)	46 ●
Calcium (mg)	12.25
Iron (mg)	10.71 ●
Sodium (g)	0
Reference	[2]

^[a] Leaves. sun-dried. grinded

Nutrition information is indicated per 100g of food plant item.

Nutrients for which no information was found: Thiamine (mg), Riboflavin (mg), Niacin (mg NE), Vitamin B6 (mg), Pantothenate (ug), Biotin (ug), Folate (ug DFE), Vitamin A (ug RAE or RE), Vitamin D (ug), Vitamin E (mg), Vitamin K (ug), Magnesium (mg), Zinc (mg), Iodine (ug), Selenium (ug), Copper (ug), Manganese (ug), Potassium (mg), Phosphorus (mg)



DIPLLOTAXIS MURALIS L.

BOTANICAL INFORMATION

An annual herb grows up to 50 cm high when in flower. The plant has multiple leaves that grow at the base of the plant close to the ground, and one or very few stems, often without leaves, on which the flowers grow. The leaves have 4-6 lobes. The flowers are yellow, 1-2 cm in diameter, and have four petals that are positioned in a cross shape. The fruits are 2-4 cm long and 1.5-2.5 mm wide and contain numerous small round seeds [2].

Growth form terrestrial herb
Life cycle annual
Centre of origin Europe and Northern Africa^[3]

DISTRIBUTION RANGE



Geographic locations where species has been reported to occur

English name
annual wall-rocket ^[1]

Scientific name
Diplotaxis muralis L.

Local names
hierba de pajaro · Guatemala

ETHNOBOTANICAL INFORMATION

The leaves of the annual wall-rocket are edible and have a pungent taste ^[3].

Occurring in farming systems in	Guatemala
Level of domestication	wild
Considered a NUS	yes
Edible parts	leaves
Contribution to food group(s)	vegetables
Popular ways of preparation or preservation	boiled
Growth place	home garden, forest
Commercialization	no

No nutritional information was found for *Diplotaxis muralis*



ELEUSINE CORACANA L.

English name
finger millet

Scientific name
Eleusine coracana L.

Local names
millet · Uganda
dukwi · Madi
alos · Ateso
kal · Luo
rukweza, rapoko · Zimbabwe
कोदो · Nepal

Transliterated names
kodo · Nepal

BOTANICAL INFORMATION

An annual grass growing up to 1.7 m tall with many thin stems. The leaves are up to 70 cm long and 2 cm wide and rough on their top side. The seeds grow at the top of the plant with many densely clustered together in 4-19 branches up to 24 cm long. These branches somewhat resemble the fingers of a hand ^[1].

Growth form grass, terrestrial herb
Life cycle annual
Centre of origin East Africa ^[1]

DISTRIBUTION RANGE



Geographic locations where species has been reported to occur

NUTRITIONAL HIGHLIGHTS



- Protein
- Thiamine
- Riboflavin
- Calcium
- Magnesium
- Copper
- Phosphorus

ETHNOBOTANICAL INFORMATION

Finger millet is an important food in sub-Saharan Africa where it is eaten mainly during times of food scarcity and in dry agro-ecosystems. It is also grown and consumed in several countries in Asia. The seeds are ground into flour to make porridge or cakes, or used as malt for making alcoholic beverages. In Asia, young plants are also eaten, either fresh or cooked. The leaves of the plant can be used for plaiting, thatching, making paper or string, and the straw from the plant is fed to animals ^[1, 2].

Occurring in farming systems in	Uganda	Zimbabwe	Nepal
Level of domestication	domesticated	domesticated	domesticated
Considered a NUS	yes	yes	yes
Edible parts	seeds	seeds	shoots
Contribution to food group(s)	cereals	cereals	vegetables
Popular ways of preparation or preservation	dried	boiled, fried or stir-fried	boiled
Growth place	home garden, other	agricultural field	agricultural field, home garden, other
Commercialization	yes	no	yes

NUTRITIONAL INFORMATION

Nutrition item	Finger millet, seed, raw ^[A]
Protein (grams)	6.2 ●
Fiber (grams)	2.9
Thiamine (mg)	0.52 ●
Riboflavin (mg)	0.3 ●
Calcium (mg)	296 ●
Magnesium (mg)	137 ●
Zinc (mg)	1.82
Iron (mg)	3.07
Copper (ug)	0.67 ●
Sodium (g)	0
Potassium (mg)	490
Phosphorus (mg)	223 ●
Reference	^[3]

Nutrition information is indicated per 100g of food plant item.

^[A] Finger millet, seed without testa, raw

Nutrients for which no information was found: Niacin (mg NE), Vitamin B6 (mg), Pantothenate (ug), Biotine (ug), Folate (ug DFE), Vitamin C (mg), Vitamin A (ug RAE or RE), Vitamin D (ug), Vitamin E (mg), Vitamin K (ug), Iodine (ug), Selenium (ug), Manganese (ug)



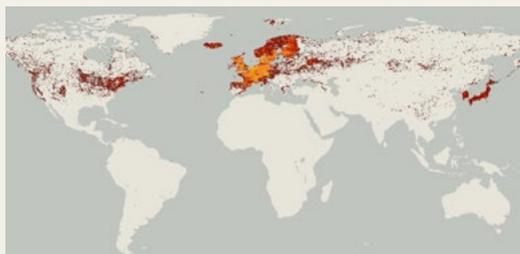
EQUISETUM ARVENSE L.

BOTANICAL INFORMATION

A perennial herb that grows mainly on disturbed land, such as agricultural fields. The plant comes in two forms that grow above the ground: the vegetative green form and the reproductive pale orange-brown form. The vegetative form consists of one ridged green stem, 20–100 cm high and up to 5 mm wide, with green branches that are placed in circles around the stem. The reproductive form consists of one main stem without branches and grows up to 25 cm high. On top of this stem is a cone, 2.5–10 cm high, on which the spores are produced. The plant has deep roots that are dark brown to black, covered in hairs, and which sometimes bear tubers ^[1].

Growth form terrestrial herb ^[1]
Life cycle perennial
Centre of origin Northern Hemisphere ^[2]

DISTRIBUTION RANGE



Geographic locations where species has been reported to occur

NUTRITIONAL HIGHLIGHTS



- Protein
- Fiber
- Vitamin E
- Calcium
- Magnesium
- Zinc
- Iron
- Copper
- Manganese

ETHNOBOTANICAL INFORMATION

The tubers and young shoots of the field horsetail are edible, both raw and cooked. The plant is also used as a medicine throughout the world for treating many different ailments ^[3].

Occurring in farming systems in	Peru
Level of domestication	wild
Considered a NUS	yes
Edible parts	stem
Contribution to food group(s)	vegetables
Popular ways of preparation or preservation	boiled
Growth place	riverside
Commercialization	no

NUTRITIONAL INFORMATION

Nutrition item	Horsetail, powder
Protein (grams)	13.53 ●
Fiber (grams)	11.9 ●
Vitamin E (mg)	70 ●
Calcium (mg)	1320 ●
Magnesium (mg)	970 ●
Zinc (mg)	7.5 ●
Iron (mg)	29.4 ●
Selenium (ug)	1
Copper (ug)	4.3 ●
Manganese (ug)	2 ●
Sodium (g)	0
Phosphorus (mg)	0.2
Reference	[4]

Nutrition information is indicated per 100g of food plant item.

Nutrients for which no information was found: Energy (kcal), Thiamine (mg), Riboflavin (mg), Niacin (mg NE), Vitamin B6 (mg), Pantothenate (ug), Biotine (ug), Folate (ug DFE), Vitamin C (mg), Vitamin A (ug RAE or RE), Vitamin D (ug), Vitamin K (ug), Iodine (ug), Potassium (mg)



FAGOPYRUM ESCULENTUM L.

BOTANICAL INFORMATION

English name
buckwheat

Scientific name
Fagopyrum esculentum L.

Local names
फापर · Nepal

Transliterated names
phafer · Nepal

An annual herb growing up to 120 cm tall. Each plant often has only one stem, which sometimes branches higher up on the plant, and which is hollow and angular. The leaves are shaped like a heart or an arrowhead, 2-10 cm long and 2-10 cm wide, and grow on leafstalks which can be very short or up to 10 cm long. Several white to pink flowers, 6-8 mm in diameter, grow on the top of the plant in small groups together. The fruits are three-sided, 6 mm long and 3 mm wide, and grey, brown or black. Each fruit contains one seed, which is green to red-brown^[1].

Growth form terrestrial herb
Life cycle annual
Centre of origin China^[1]
Stress Tolerance Buckwheat seeds do not develop well on nitrogen rich soils^[1].

DISTRIBUTION RANGE



Geographic locations where species has been reported to occur

ETHNOBOTANICAL INFORMATION

The seeds of buckwheat are ground into flour which is used for making a wide variety of products around the world, such as pancakes, noodles, and porridge. As buckwheat is not a grass, its seeds are not officially called grains, but they are used in a similar way. Buckwheat does not contain gluten, such as many grains do, giving it other qualities when baked. Buckwheat flour is often mixed with flour from grains, as it is very nutritious compared to grains. The young shoots of buckwheat are also edible and are often fried^[1].

Occurring in farming systems in	Nepal
Level of domestication	domesticated
Considered a NUS	yes
Edible parts	leaves, seeds
Contribution to food group(s)	vegetables; legumes, nuts and seeds
Popular ways of preparation or preservation	fried or stir-fried
Growth place	agricultural field, home garden
Commercialization	yes

No nutritional information was found for *Fagopyrum esculentum*



HIBISCUS SABDARIFFA L.

BOTANICAL INFORMATION

An annual herb growing up to 4.5 m high with a green or reddish stem. The leaves are smooth or sometimes slightly hairy, up to 15 cm long and up to 15 cm wide, with 3-5 lobes, and grow at the end of leafstalks 0.5-12 cm long. The flowers are up to 10 cm in diameter and have 5 pale yellow or pale pink petals. The center of the flower is dark purple-red and from it grows a thin central pink column up to 2 cm long from which the male and female flower parts grow. The ripe fruit is fleshy, shiny, and dark red and up to 2.5 cm long. The seeds are dark brown, smooth, and kidney-shaped, 4 mm long and 3 mm wide ^[1].

Growth form terrestrial herb (Zambia Shibuyunji), shrub (Uganda ESAFF)
Life cycle annual
Centre of origin Africa ^[1]

DISTRIBUTION RANGE



Geographic locations where species has been reported to occur

NUTRITIONAL HIGHLIGHTS



- Fiber
- Phosphorus



- Fiber
- Thiamine
- Riboflavin
- Vitamin B6
- Folate
- Vitamin C
- Vitamin A

- Vitamin E
- Calcium
- Magnesium
- Iron
- Copper
- Potassium



ETHNOBOTANICAL INFORMATION

Young roselle shoots, leaves, and calyces (the shiny outside part of the fruits) are all edible. The leaves, shoots, and young green calyces are cooked in soups or sauces or added raw or cooked as vegetables to other dishes. The calyces can also be dried and ground into powder for storage. The ripe red calyces are steeped in boiling water to make tea which is either drunk hot or used to make sweetened drinks or ice. The seeds are also edible and can be roasted or ground into a paste used for making cakes. The fiber from the bast is used for making ropes and nets and the whole plant can be used as fodder ^[1].

Occurring in farming systems in	Zambia	Uganda	Nepal
Level of domestication	domesticated	domesticated	domesticated
Considered a NUS	no	yes	yes
Edible parts	leaves, flowers	leaves, seeds	leaves, seeds
Contribution to food group(s)	vegetables	vegetables; legumes, nuts and seeds	vegetables; legumes, nuts and seeds
Popular ways of preparation or preservation	boiled, fried or stir-fried, dried (dehydrated)	boiled, dried (dehydrated)	fried or stir-fried
Growth place	agricultural field, home garden, forest, roadside, other	agricultural field, home garden, roadside, other	-
Commercialization	yes	yes	-

NUTRITIONAL INFORMATION

Nutrition item	Roselle leaves, raw ^[A]	Roselle leaves and flowers, dried and pounded ^[B]	Roselle leaves, raw ^[C]
Energy (kcal)	43	276	54
Protein (grams)	3.3	4.9	1.7
Fiber (grams)	1.6	15.8 ●	6.2 ●
Thiamine (mg)	0.17	0.14	0.21 ●
Riboflavin (mg)	0.45 ●		0.56 ●
Niacin (mg NE)	1.2		1.5
Vitamin B6 (mg)			0.37 ●
Folate (ug DFE)			144 ●
Vitamin C (mg)	54 ●		41 ●
Vitamin A (ug RAE or RE)			265 ●
Vitamin E (mg)			2.34 ●
Calcium (mg)	213 ●	55	241 ●
Magnesium (mg)			72 ●
Zinc (mg)			1.11
Iron (mg)	4.8 ●		12.3 ●
Copper (ug)			0.22 ●
Sodium (g)			7
Potassium (mg)			539 ●
Phosphorus (mg)	93	163 ●	80
Reference	[2]	[2]	[3]

Nutrition information is indicated per 100g of food plant item. ^[A] Jamaica sorrel, roselle, leaves, raw ^[B] Jamaica sorrel, roselle, leaves and flowers, dried and pounded ^[C] Raw leaves, roselle
 Nutrients for which no information was found: Pantothenate (ug), Biotine (ug), Vitamin D (ug), Vitamin K (ug), Iodine (ug), Selenium (ug), Manganese (ug)

IPOMOEA BATATAS L.

BOTANICAL INFORMATION

A perennial creeping or climbing plant that can grow up to 8 m long. Sweet potato has starchy tubers that vary in size and color but can be white, yellow, brown, red, or purple on the outside and white, yellow, orange, or purple on the inside. The leaves are often lobed, 2-15 cm long and 4-12 cm wide, and grow on leafstalks 5-30 cm long. The flowers are white or purple with a darker purple center, shaped like a funnel, and grow on flower stalks 3-18 cm long. The fruits are 5-8 mm long and contain up to 4 small black seeds^[1, 2].

Growth form creeper, climber
Life cycle perennial^[3]
Centre of origin Central and South America
Stress Tolerance Sweet potatoes needs temperatures between 12 and 35°C and can not stand waterlogged soils^[1].

DISTRIBUTION RANGE



Geographic locations where species has been reported to occur

NUTRITIONAL HIGHLIGHTS



- Biotine
- Copper
- Manganese
- Sodium



- Vitamin C
- Magnesium
- Copper



- Protein
- Vitamin C
- Iron



- Riboflavin
- Vitamin C
- Calcium
- Iron

ETHNOBOTANICAL INFORMATION

Sweet potato is grown around the world and is an important staple food for many people, which led to the cultivation of many different varieties. The tubers, young shoots, and leaves of sweet potato are all edible. The plant is also fed to livestock. It is mainly vegetatively propagated^[1, 2].

Occurring in farming systems in	Zambia, Uganda, Laos, Zimbabwe, Nepal
Level of domestication	domesticated
Considered a NUS	no ZAM, LAO, ZIM • yes UGA, NEP
Edible parts	roots/tubers ZAM, UGA, LAO, ZIM, NEP • leaves ZAM, UGA, LAO, ZIM
Contribution to food group(s)	tubers and roots ZAM, UGA, LAO, ZIM, NEP • vegetables ZAM, UGA, LAO, ZIM
Popular ways of preparation or preservation	boiled ZAM, UGA, ZIM, NEP • [stir]fried UGA, ZIM • steamed UGA, LAO; dried or dehydrated ZAM, UGA • raw ZAM
Growth place	agricultural field ZAM, UGA, LAO, ZIM, NEP • home garden ZAM, UGA, NEP • forest ZAM, NEP • roadside ZAM • other ZAM, UGA
Commercialization	yes ZAM, UGA, NEP • no LAO, ZIM

NUTRITIONAL INFORMATION

Nutrition item	Sweet potato, boiled ^[A]	Sweet potato, raw ^[B]	Sweet potato leaves, boiled ^[C]	Sweet potato leaves, raw ^[D]
Energy (kcal)	97	89	166	49
Protein (grams)	1.3	1.1	8.53 ●	4.6
Fiber (grams)	2.6	2.2		2.4
Thiamine (mg)	0.07	0.07		0.1
Riboflavin (mg)	0.01	0.03		0.28 ●
Niacin (mg NE)	0.7	0.4		0.9
Vitamin B6 (mg)	0.09	0.19		
Pantothenate (ug)	0.51			
Biotine (ug)	6.1 ●			
Folate (ug DFE)	8	38		
Vitamin C (mg)	9	16 ●	65.16 ●	70 ●
Vitamin A (ug RAE or RE)		2		
Vitamin D (ug)	0	0		
Vitamin E (mg)	0.29	0.13		
Calcium (mg)	19	17	1.34	158 ●
Magnesium (mg)	11	81 ●		
Zinc (mg)	0.2	0.82	0.16	
Iron (mg)	0.4	1	31.67 ●	6.2 ●
Selenium (ug)		1		
Copper (ug)	0.2 ●	1.24 ●		
Manganese (ug)	120 ●			
Sodium (g)	6.1 ●	15		
Potassium (mg)	302	337		
Phosphorus (mg)	38	38		84
Reference	[3]	[3]	[4]	[5]

Nutrition information is indicated per 100g of food plant item.

^[A] Sweet potato, white-fleshed, without skin, boiled, (Mbatata yoyera mkati yowilitsa)

^[B] Sweet potato, white-fleshed, raw, (Mbatata zoyera mkati) ^[C] Sweet potato boiled leaves

^[D] Sweet potatoes, leaves, raw

Nutrients for which no information was found: Vitamin K (ug), Iodine (ug)



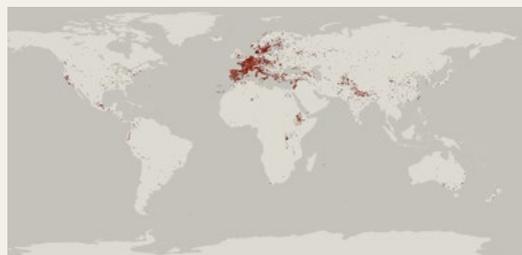
LATHYRUS OLERACEUS L.

BOTANICAL INFORMATION

An annual climbing herb up to 2 m tall. The leaves are made up of a leafstalk of 4-6 cm long and 2-6 oval leaflets of 1.5-8 cm long and 0.5-4 cm wide. Each leaf ends in a tendril with several hooks on it that help the plant climb onto things. The flowers are purple to white, 1.5-3 cm long and 2.5-4.5 cm wide and grow with 1-3 together at the base of the leaves. The fruits are green bean pods, 3.5-15 cm long and 1-2.5 cm wide, and contain 2-11 round seeds of 5-8 mm in diameter which are either green, yellow, or sometimes purple^[1].

Growth form herb^[1]
 Life cycle annual
 Centre of origin Western Asia^[1]

DISTRIBUTION RANGE



Geographic locations where species has been reported to occur

NUTRITIONAL HIGHLIGHTS



- Protein
- Fiber
- Thiamine
- Niacin
- Biotine
- Folate
- Vitamin C
- Copper
- Manganese
- Sodium
- Protein
- Fiber
- Thiamine
- Riboflavin
- Protein
- Fiber
- Thiamine
- Vitamin B6
- Folate
- Zinc
- Iron
- Copper
- Manganese
- Phosphorus



ETHNOBOTANICAL INFORMATION

Peas are provided by several species and are an important group of crops around the world. There are three types of peas: those whose dried seeds are eaten, also known as field peas, those whose young seeds are eaten, also known as garden peas, and the sugar pea, whose young fruits are eaten. Young peas can be eaten raw in small quantities, but the best is to boil or fry them before consumption. The young leaves are also edible after cooking^[1]. The related species *Lathyrus sativus* can be poisonous.

Occurring in farming systems in	Uganda	Peru
Level of domestication	domesticated	domesticated
Considered a NUS	yes	no
Edible parts	seeds	shoots, seeds
Contribution to food group(s)	legumes, nuts and seeds	vegetables; legumes, nuts and seeds
Popular ways of preparation or preservation	dried or dehydrated	boiled, dried or dehydrated
Growth place	home garden, other	agricultural field
Commercialization	yes	yes

NUTRITIONAL INFORMATION

Nutrition item	Peas, raw ^[A]	Green peas, dry ^[B]	Peas, cooked ^[C]
Energy (kcal)	88	337	84
Protein (grams)	5.5 ●	25 ●	5.36 ●
Fiber (grams)	6.3 ●	4.5 ●	4.3 ●
Thiamine (mg)	0.28 ●	0.8 ●	0.26 ●
Riboflavin (mg)	0.08	0.2 ●	0.15
Niacin (mg NE)	2.5 ●		2.02
Vitamin B6 (mg)	0.1		0.22 ●
Pantothenate (ug)	0.38		
Biotine (ug)	13 ●		
Folate (ug DFE)	82 ●		63 ●
Vitamin C (mg)	27 ●		14.2
Vitamin A (ug RAE or RE)		30	40
Vitamin D (ug)	0		0
Vitamin E (mg)	0.04		
Calcium (mg)	20	70	27
Magnesium (mg)	28		39
Zinc (mg)	0.87		4.08 ●
Iron (mg)	1.7	3	14 ●
Selenium (ug)			0
Copper (ug)	0.17 ●		0.71 ●
Manganese (ug)	330 ●		1 ●
Sodium (g)	13 ●		3
Potassium (mg)	265		271
Phosphorus (mg)	83		117 ●
Reference	[2]	[3]	[4]

Nutrition information is indicated per 100g of food plant item.

^[A] Peas, raw, *Pisum sativum*, (Nsawawa zaziwisi) ^[B] Green pea, dry ^[C] Pea, cooked
 Nutrients for which no information was found: Vitamin K (ug), Iodine (ug), Selenium (ug)

LEPIDIUM SATIVUM L.

BOTANICAL INFORMATION

An annual herb of 30–70 cm high with a much-branched stem. There is a lot of variation in the appearance of different plants. The leaves on the lower part of the plant are generally up to 12 cm long and 9 cm wide and are shaped somewhat like a feather with one midrib from which multiple small leaflets stick to the side. The leaflets are often shaped like a lance and are up to 3 cm long. The leaves higher on the plant are not divided into smaller leaflets. The flowers are white to violet, 3–6 mm in diameter, with four petals positioned in a cross shape. The flowers often grow at the end of the branches with multiple together. The fruits are flat and oval in shape, up to 6.5 mm in length and 1.5 mm in width, and colored pale green to yellow with one reddish-brown seed inside^[1].

Growth form terrestrial herb
Life cycle annual
Centre of origin Ethiopia/West Asia

DISTRIBUTION RANGE



Geographic locations where species has been reported to occur

NUTRITIONAL HIGHLIGHTS



- Protein
- Vitamin A
- Calcium
- Iron
- Phosphorus

ETHNOBOTANICAL INFORMATION

The seedlings, young plants, and leaves of garden cress are eaten raw in salads or boiled in soups and sauces and are favoured for their spicy taste.

Occurring in farming systems in	Nepal
Level of domestication	domesticated
Considered a NUS	yes
Edible parts	whole aerial parts
Contribution to food group(s)	vegetables
Popular ways of preparation or preservation	fried or stir-fried
Growth place	agricultural field, forest
Commercialization	no

NUTRITIONAL INFORMATION

Nutrition item	Garden cress, raw
Energy (kcal)	67
Protein (grams)	5.8 ●
Thiamine (mg)	0.15
Vitamin A (ug RAE or RE)	5839 ●
Calcium (mg)	360 ●
Iron (mg)	28.6 ●
Phosphorus (mg)	110 ●
Reference	[2]

Nutrition information is indicated per 100g of food plant item.

Nutrients for which no information was found: Fiber (grams), Riboflavin (mg), Niacin (mg NE), Vitamin B6 (mg), Pantothenate (ug), Biotine (ug), Folate (ug DFE), Vitamin C (mg), Vitamin D (ug), Vitamin E (mg), Vitamin K (ug), Magnesium (mg), Zinc (mg), Iodine (ug), Selenium (ug), Copper (ug), Manganese (ug), Sodium (g), Potassium (mg)



LINUM USITATISSIMUM L.

BOTANICAL INFORMATION

An annual herb growing up to 1.2 m tall with a greyish-green color and a single slender stem that is up to 4 mm wide. The leaves are shaped like the tip of a lance and are 2.5-3.5 cm long and 3-5 mm wide. The flowers are 2-3 cm in diameter with 5 white, pale blue or purple-blue petals. The fruit is dry and round, 7-10 mm in diameter, and contains up to 10 shiny, yellow to dark brown seeds, up to 10 mm long and 3 mm wide ^[1].

Growth form terrestrial herb
Life cycle annual
Centre of origin West Asia ^[2]

DISTRIBUTION RANGE



Geographic locations where species has been reported to occur

ETHNOBOTANICAL INFORMATION

Flax has been domesticated into a type that produces strong fibers, often called flax, and a type that produces larger seeds often referred to as linseed. Flax fibers are extracted from the bark and processed into linen, which is used for household textiles and clothes. The seeds are edible and can be toasted or boiled. The seeds are also processed on an industrial scale to make linseed oil, which is used primarily for chemical products such as paint ^[1].

Occurring in farming systems in	Peru
Level of domestication	domesticated
Considered a NUS	yes
Edible parts	seeds
Contribution to food group(s)	nuts, seeds and legumes
Popular ways of preparation or preservation	boiled
Growth place	home garden
Commercialization	no

No nutritional information was found for *Linum usitatissimum*



LUPINUS MUTABILIS L.

BOTANICAL INFORMATION

An annual herb that grows up to 2.5 m high, with a slightly woody stem and many branches. The leaves are made up of one dark green or reddish-green leafstalk with 7–9 leaflets that grow in a circle at the end. The leaflets are yellow-green, shaped like a stretched oval, and about 6 cm long and 1 cm wide. The flowers grow at the end of the branches with up to 60 together in a cone shape. The flowers are 1–2 cm long and colored blue, pink, white, or a mix of those colors, with a yellow spot in the middle of each flower. The fruits are shaped like a bean pod, up to 12 cm long and hairy, and contain up to 9 seeds. The seeds are 0.5–1.5 cm in diameter and black, dark brown, white, or white with a black or grey circle^[1].

Growth form: terrestrial herb
 Life cycle: annual^[1]
 Centre of origin: Andes
 Stress Tolerance: Andean lupin does not tolerate temperatures higher than 25°C. Young plants are damaged by frost but mature plants are frost resistant^[1].

DISTRIBUTION RANGE



Geographic locations where species has been reported to occur

NUTRITIONAL HIGHLIGHTS



- Protein
- Fiber
- Calcium
- Magnesium
- Zinc

- Iron
- Copper
- Potassium
- Phosphorus



- Protein
- Fiber
- Magnesium
- Zinc

- Copper
- Phosphorus

ETHNOBOTANICAL INFORMATION

The seeds of Andean lupin are eaten as a snack or in soups and salads. They need to be soaked in water for a few days and then boiled before they can be eaten. The lupin plant furthermore helps to prevent erosion and fertilizes the soil^[1].

Occurring in farming systems in	Peru
Level of domestication	domesticated
Considered a NUS	yes
Edible parts	seeds
Contribution to food group(s)	legumes, nuts and seeds
Popular ways of preparation or preservation	raw, boiled, steamed
Growth place	agricultural field
Commercialization	yes

NUTRITIONAL INFORMATION

Nutrition item	Lupin seeds, whole, raw ^[A]	Lupin seeds, whole, soaked, boiled, drained, without salt ^[B]
Energy (kcal)	308	132
Protein (grams)	34.06 ●	14.62 ●
Fiber (grams)	35.3 ●	15.2 ●
Calcium (mg)	296 ●	108
Magnesium (mg)	213 ●	59 ●
Zinc (mg)	5.22 ●	2.22 ●
Iron (mg)	6.01 ●	2.19
Copper (ug)	0.66 ●	0.2 ●
Sodium (g)	0	4
Potassium (mg)	1033 ●	333
Phosphorus (mg)	502 ●	194 ●
Reference	[2]	[2]

Nutrition information is indicated per 100g of food plant item.

^[A] Lupin, seeds, whole, dried, raw ^[B] Lupin, seeds, whole, soaked, boiled, drained, without salt

Nutrients for which no information was found: Thiamine (mg), Riboflavin (mg), Niacin (mg NE), Vitamin B6 (mg), Pantothenate (ug), Biotine (ug), Folate (ug DFE), Vitamin C (mg), Vitamin A (ug RAE or RE), Vitamin D (ug), Vitamin E (mg), Vitamin K (ug), Iodine (ug), Selenium (ug), Manganese (ug)



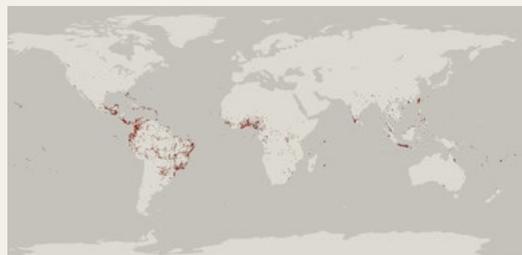
MANIHOT ESCULENTA CRANTZ L.

BOTANICAL INFORMATION

A perennial shrub growing up to 4 m tall with white latex throughout the plant. The plant produces multiple tubers underground which differ a lot in size and shape depending on the variety, but which can be up to 1 m long and 15 cm in diameter. The tubers have a dark brown almost woody peel and a white, yellowish, or reddish inside. The stems are woody with few branches and are greyish or brownish in color. The leaves have a leafstalk of 5–30cm long and 3–10 leaflets that grow in a circle-like pattern at the end of the leafstalk like fingers on a hand. The flowers grow at the end of the branches and have 5 petals, and are colored pinkish, yellowish, or greenish. The fruits are green and round, 1–1.5 cm in diameter, and contain up to 3 oval seeds ^[1].

Growth form shrub ^[1]
 Life cycle perennial ^[1]
 Centre of origin tropical America ^[1]

DISTRIBUTION RANGE



Geographic locations where species has been reported to occur

NUTRITIONAL HIGHLIGHTS



- Protein
- Fiber
- Riboflavin
- Vitamin A
- Vitamin E
- Calcium
- Magnesium
- Iron
- Manganese



- Protein
- Vitamin C
- Calcium
- Iron
- Phosphorus



- Vitamin C
- Copper
- Manganese



- Fiber
- Calcium
- Magnesium
- Zinc
- Iron
- Copper
- Manganese



ETHNOBOTANICAL INFORMATION

The starchy tubers of the cassava plant have been a staple food in South America for millennia and the plant is now cultivated throughout the tropical parts of the world, both for human and animal consumption. There is large variation both in the variety of plants that are being cultivated as well as the local uses. Some varieties have toxic tubers that need to be grated and soaked in water first, whereas other varieties do not need any treatment other than cooking. In many Asian countries, the plant is primarily grown for industrial processing of tubers, while in Africa and South America, the plants are grown mainly for direct human consumption. The tubers are eaten boiled or fried or used as baking flour ^[1].

Occurring in farming systems in	Zambia	Uganda	Laos
Level of domestication	domesticated	domesticated	domesticated
Considered a NUS	no	yes	no
Edible parts	roots and tubers, leaves	roots and tubers, leaves	roots and tubers, leaves
Contribution to food group(s)	tubers and roots; vegetables	tubers and roots; vegetables	tubers and roots; vegetables
Popular ways of preparation or preservation	boiled, dried (dehydrated)	boiled, fried or stir-fried, steamed, dried (dehydrated)	steamed
Growth place	agricultural field, home garden, forest, roadside, other	home garden, other	agricultural field, home garden
Commercialization	yes	yes	no

NUTRITIONAL INFORMATION

Nutrition item	Cassava leaves, boiled ^[A]	Cassava leaves, dried ^[B]	Cassava tuber, boiled ^[C]	Cassava leaves, raw ^[d]
Energy (kcal)	85	266	146	478
Protein (grams)	6.1 ●	23.5 ●	1.1	
Fiber (grams)	3 ●		1.7	5.64 ●
Thiamine (mg)	0.13		0.03	
Riboflavin (mg)	0.24 ●		0.04	
Niacin (mg NE)	0.9		0.06	
Vitamin B6 (mg)	0.16		14	
Folate (ug DFE)	48		14	
Vitamin C (mg)	12	24 ●	19 ●	
Vitamin A (ug RAE or RE)	211 ●		1	
Vitamin D (ug)	0			
Vitamin E (mg)	1.97 ●		0.18	
Calcium (mg)	178 ●	313 ●	26	234.84 ●
Magnesium (mg)	75 ●		22	53.56 ●
Zinc (mg)	1.2			3.37 ●
Iron (mg)	3.4 ●	8 ●	0.6	5.47 ●
Copper (ug)	0.05		0.2 ●	0.82 ●
Manganese (ug)	920 ●		280 ●	3 ●
Sodium (g)	0		7	24.72
Potassium (mg)	304		263	284.28
Phosphorus (mg)	94	431 ●	43	37.08
Reference	[2]	[3]	[2]	[4]

Nutrition information is indicated per 100g of food plant item. ^[A] Leaves, cassava, boiled, (Ntapasha/Chigwada chowilitisa) ^[B] Leaves, dried ^[C] Cassava, tuber, boiled, (Chinangwa chopihika) ^[d] Cassava, mature leaves, raw
 Nutrients for which no information was found: Pantothenate (ug), Biotine (ug), Vitamin D (ug), Vitamin K (ug), Iodine (ug), Selenium (ug)

NASTURTIUM OFFICINALE L.

BOTANICAL INFORMATION

A perennial herb with stems that are up to 1 m long and much branched. The plant grows along water edges or in shallow ponds and has hollow stems that allow it to float. The leaves are up to 10 cm long and are composed of 4-18 round or oval leaflets that grow opposite of each other. The flowers in multiples together at the end of a branch. Flowers are white, about 5 mm in diameter, and have 4 petals that are arranged in a cross shape. The fruits are green and shaped somewhat like a bean pod, 1-2 cm long and 2-3 mm wide, and contain many seeds. The seeds are round and dark red-brown^[1].

Growth form aquatic herb
 Life cycle perennial^[1]
 Centre of origin Europe & western Asia^[1]

DISTRIBUTION RANGE



Geographic locations where species has been reported to occur

NUTRITIONAL HIGHLIGHTS



- Riboflavin
- Vitamin C
- Vitamin A
- Calcium
- Iron
- Copper

- Vitamin A

ETHNOBOTANICAL INFORMATION

The young shoots and leaves of watercress have a spicy taste and are eaten raw, popular in salads, or as a cooked vegetable^[1].

Occurring in farming systems in	Guatemala	Peru
Level of domestication	domesticated	wild
Considered a NUS	yes	yes
Edible parts	leaves	shoots
Contribution to food group(s)	vegetables	vegetables
Popular ways of preparation or preservation	boiled	raw
Growth place	agricultural field, roadside	other, near the water
Commercialization	yes	no

NUTRITIONAL INFORMATION

Nutrition item	Watercress leaves, raw ^[A]	Watercress, unknown ^[B]	Watercress, cooked ^[C]
Energy (kcal)	33.15	24.5	
Protein (grams)	4.84	2.9	2.69
Fiber (grams)		1.46	
Thiamine (mg)	0.06	0.12	
Riboflavin (mg)	0.28 ●	0.14	
Niacin (mg NE)	0.68	1.2	
Vitamin B6 (mg)		0.13	
Folate (ug DFE)		9	
Vitamin C (mg)	16.56 ●	41.75 ●	
Vitamin A (ug RAE or RE)	300.01 ●	160 ●	470.8 ●
Vitamin D (ug)		0	
Calcium (mg)	197.43 ●	127.66	
Magnesium (mg)	26.16	21	
Zinc (mg)	0.28	0.11	0.32
Iron (mg)	23.16 ●	2.51	2.09
Selenium (ug)		0.03	
Copper (ug)	0.14 ●	0.08	
Manganese (ug)		0	
Sodium (g)	0	41	
Potassium (mg)	405.71	330	27.82
Phosphorus (mg)	41.32	62.67	
Reference	[2]	[3]	[4]

Nutrition information is indicated per 100g of food plant item.

^[A] Watercress, leaves, raw ^[B] Berro, watercress ^[C] Watercress, cooked

Nutrients for which no information was found: Pantothenate (ug), Biotine (ug), Vitamin E (mg), Vitamin K (ug), Iodine (ug)



OPHIGLOSSUM CALIFORNICUM L.

BOTANICAL INFORMATION

A perennial herb with one single fleshy leaf and a stalk on which the spores form. Every year the leaf dies off and a new leaf is produced at the start of the next growing season. During part of the year the plant has a slender fleshy stalk, with on top of it a slightly thicker green shape that somewhat resembles the tongue of a snake. This top part of the stalk produces the spores, from which new plants grow ^[1].

Growth form terrestrial herb
Life cycle perennial ^[1]
Centre of origin California & Mexico ^[1,2]

DISTRIBUTION RANGE



Geographic locations where species has been reported to occur

ETHNOBOTANICAL INFORMATION

Occurring in farming systems in	Nepal
Level of domestication	wild
Considered a NUS	yes
Edible parts	leaves, whole aerial parts
Contribution to food group(s)	vegetables
Popular ways of preparation or preservation	fried or stir-fried
Growth place	home garden, forest

No nutritional information was found for *Ophioglossum californicum*



English name
California adder's tongue

Scientific name
Ophioglossum californicum L.

Local names
जङ्गिरे साग · Nepal

Transliterated names
jibre sag, ekpate sag, jimariya,
jiviya sag, nakpolawa · Nepal

OXALIS TUBEROSA L.

BOTANICAL INFORMATION

A perennial herb with fleshy stems that grows up to 30 cm tall. The plant has yellow, red, or purple tubers 5-7.5 cm long and 2-4 cm wide. The leaves are composed of three smaller leaflets resembling the shape of clover leaves and grow on leafstalks 7-10 cm long. The leaflets are up to 2.5 cm long. The flowers have 5 yellow petals and grow with 5-8 together at the top of the plant ^[1,2].

Growth form terrestrial herb
Life cycle perennial
Centre of origin Andes

DISTRIBUTION RANGE



Geographic locations where species has been reported to occur

NUTRITIONAL HIGHLIGHTS



● Vitamin C

ETHNOBOTANICAL INFORMATION

Oca is one of the most important staple foods among indigenous peoples in many parts of the Andes. The tubers are eaten cooked, roasted, or dried for later use and some varieties can be eaten raw. There is a lot of variation in the colors and tastes of the tubers. There are four varieties, which are often eaten in stews, fried or roasted, and sweet varieties, which are often placed in the sun for a few days so they become even sweeter and which can then be boiled with honey or sugar to make candy ^[1,2].

Occurring in farming systems in	Peru
Level of domestication	domesticated
Considered a NUS	yes
Edible parts	roots/tubers, leaves, flowers
Contribution to food group(s)	tubers and roots; vegetables
Popular ways of preparation or preservation	boiled, fried or stir-fried, steamed, dried or dehydrated, frozen
Growth place	agricultural field, home garden
Commercialization	yes

NUTRITIONAL INFORMATION

Nutrition item	Oca, raw ^[A]	Oca, boiled ^[B]
Energy (kcal)	53	63
Protein (grams)	0.7	
Fiber (grams)	2.4	
Thiamine (mg)	0.01	
Riboflavin (mg)	0.06	
Niacin (mg NE)	0.61	
Vitamin C (mg)	23.92 ●	
Vitamin A (ug RAE or RE)	0	
Calcium (mg)		3
Magnesium (mg)		4
Zinc (mg)	0.14	0.12
Iron (mg)	0.47	0.58
Copper (ug)		0.06
Sodium (g)		0
Potassium (mg)		123
Phosphorus (mg)		20
Reference	[3]	[4]

Nutrition information is indicated per 100g of food plant item.

^[A] Oca, raw, without skin ^[B] Oca, peeled, boiled, without salt

Nutrients for which no information was found: Vitamin B6 (mg), Pantothenate (ug), Biotine (ug), Folate (ug DFE), Vitamin D (ug), Vitamin E (mg), Vitamin K (ug), Iodine (ug), Selenium (ug), Manganese (ug)



PACHYRHIZUS EROSUS L.

BOTANICAL INFORMATION

A perennial herb with stiff bristly hairs that sometimes climbs like a vine up to 6 m long. Each plant has one or sometimes a few tubers which can grow up to 30 cm long and 25 cm wide but which are often smaller, with a creamy to dark brown skin and white or white-yellow flesh. Each leaf is made up of three leaflets covered in bristly hairs. The two smaller leaflets at the base are more or less oval to rectangular, 2.5-10.5 cm long and 2.5-18 cm wide. The leaflet at the tip of each leaf is oval or kidney-shaped 3.5-17.5 cm long and 4-21 cm wide. The flowers grow with many together at the tip of a flower stalk which can be up to 55 cm long. The flowers are purple, blue, or white and 1-2.5 cm long. The fruit is a green bean-shaped pod, 6-13 cm long and 8-17 mm wide, often hairy when young but smooth when ripe, and contains several seeds. The green, brown, or dark reddish-brown seeds are flat, squared, or rounded and 3-9 mm in diameter^[2].

Growth form terrestrial herb, climber^[2]
 Life cycle perennial^[2]
 Centre of origin Central America

DISTRIBUTION RANGE



Geographic locations where species has been reported to occur

NUTRITIONAL HIGHLIGHTS



- Protein
- Fiber
- Calcium
- Zinc
- Iron
- Copper
- Potassium
- Phosphorus

ETHNOBOTANICAL INFORMATION

The tubers of the yam bean are eaten raw or slightly fried, for example in salads, or cooked and used in soups. The young seed pods can be eaten as a vegetable as well. The whole plant including the tubers makes good fodder for animals^[2].

Occurring in farming systems in	Zimbabwe
Level of domestication	wild
Considered a NUS	yes
Edible parts	leaves
Contribution to food group(s)	vegetables
Popular ways of preparation or preservation	boiled, fried to stir-fried

NUTRITIONAL INFORMATION

Nutrition item	Yam bean seeds, raw ^[A]	Yam bean tuber, raw ^[B]
Protein (grams)	28.27 ●	0.35
Fiber (grams)	6.2 ●	
Calcium (mg)	356 ●	
Zinc (mg)	4 ●	
Iron (mg)	16 ●	
Copper (ug)	1.2 ●	
Sodium (g)	0	
Potassium (mg)	992 ●	
Phosphorus (mg)	286 ●	
Reference	[3]	[3]

Nutrition information is indicated per 100g of food plant item.

^[A] Yam bean seeds, raw ^[B] Yam bean tuber, Catania, peeled, raw

Nutrients for which no information was found: Energy (kcal), Thiamine (mg), Riboflavin (mg), Niacin (mg NE), Vitamin B6 (mg), Pantothenate (ug), Biotin (ug), Folate (ug DFE), Vitamin C (mg), Vitamin A (ug RAE or RE), Vitamin D (ug), Vitamin E (mg), Vitamin K (ug), Magnesium (mg), Iodine (ug), Selenium (ug), Manganese (ug)



PASSIFLORA EDULIS L.

English name
Passionfruit ^[1]

Scientific name
Passiflora edulis L.

Local names
ໝາກນອດ · Laos

BOTANICAL INFORMATION

A perennial fast-growing climber with vines that are semi-woody and up to 15 m long. The stem is green and grooved. The leaves do not have lobes when they are young but when they get older they grow divided into three equally large lobes. Leaves are 10–15 cm long and 12–25 cm wide and grow on a leafstalk of 2–5 cm long. At the base of every leaf, there is a tendril that curls spirally around other things close by to help the plant climb up. The flowers grow alone, also from the base of the leaves. The flowers are showy and smell nice, and are 7.5–10 cm in diameter. The flowers are made up of ten white to purple petals, many 2–3 cm long threads in a circle around the center, and large male and female flower parts at the center which are greenish-yellow. The fruits are round to oval, 4–12 cm in diameter, and deep purple or bright yellow on the outside of their thick peel. The inside is made up of many seeds and a yellow juicy pulp ^[1].

Growth form climber ^[1]
Life cycle perennial
Centre of origin Southern Brazil ^[1]

DISTRIBUTION RANGE



Geographic locations where species has been reported to occur

ETHNOBOTANICAL INFORMATION

The inside juicy pulp of the fruit and its seeds are edible and have a strong sweet sour taste. It is eaten fresh or made into drinks. Popular around the globe ^[1].

Occurring in farming systems in	Laos
Level of domestication	wild
Considered a NUS	yes
Edible parts	fruits
Contribution to food group(s)	fruits
Popular ways of preparation or preservation	raw

No nutritional information was found for *Passiflora edulis*



PASSIFLORA PINNATISTIPULA L.

BOTANICAL INFORMATION

A perennial fast-growing climber. The leaves have three equally large lobes up to 12 cm long. At the base of every leaf, there is a tendril that curls spirally around other things close by to help the plant climb up. The flowers grow alone, also at the base of the leaves. The flowers are showy and smell nice, and are made up of ten pink petals, many blue threads in a circle around the center, and large male and female flower parts at the center which are greenish-yellow to orange. The fruits are round and yellow on the outside of their thick peel. The inside is made up of many seeds and a yellow juicy pulp ^[1].

Growth form climber
Life cycle perennial
Centre of origin Andes

DISTRIBUTION RANGE



Geographic locations where species has been reported to occur

English name
yellow passionfruit ^[1]

Scientific name
Passiflora pinnatistipula L.

Local names
granadilla · Peru

ETHNOBOTANICAL INFORMATION

The inside juicy pulp of the fruit and its seeds are edible and have a sweet taste. It is eaten fresh or made into drinks ^[2]. The species is less well known than *P. edulis*.

Occurring in farming systems in	Peru
Level of domestication	domesticated
Considered a NUS	yes
Edible parts	fruits
Contribution to food group(s)	fruits
Popular ways of preparation or preservation	raw
Growth place	forest
Commercialization	yes

No nutritional information was found for *Passiflora pinnatistipula*



PASSIFLORA TRIPARTITA L.

BOTANICAL INFORMATION

English name
banana passionfruit^[1]

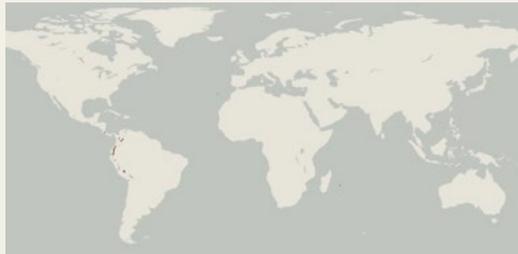
Scientific name
Passiflora tripartita L.

Local names
tumbo · Peru

A perennial climber with a woody stem that can grow up to 10 m long. The stems are round and covered with yellow hair. The leaves have three equally large lobes, 6-16 cm long, and are covered in soft hairs. At the base of each leaf grows a tendril which curls spirally around other things close by to help the plant climb up. The showy flowers hang down and grow alone, also from the base of the leaves. The flowers are made up of a grey-green to reddish tube of 7-10 cm long and pink petals of 4-5 cm long which are situated at the end of the tube. The fruits are 5-12 cm long and 3-4 cm wide, yellow-orange to pale green on the outside, and covered with soft hairs. The inside is made up of many seeds neatly stacked in shiny orange pulp^[1].

Growth form climber
Life cycle perennial
Centre of origin Andes

DISTRIBUTION RANGE



Geographic locations where species has been reported to occur

ETHNOBOTANICAL INFORMATION

The inside juicy pulp of the fruit and its seeds are edible and have a sweet or sour taste. It is eaten fresh or made into drinks^[1]. The species is less wellknown than *P. edulis*.

Occurring in farming systems in	Peru
Level of domestication	domesticated
Considered a NUS	yes
Edible parts	fruits
Contribution to food group(s)	fruits
Popular ways of preparation or preservation	raw
Growth place	home garden
Commercialization	no

No nutritional information was found for *Passiflora tripartita*



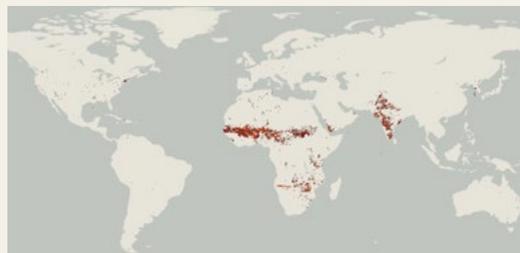
PENNISETUM GLAUCUM L.

BOTANICAL INFORMATION

An annual grass that can grow up to 4 m high. The stem is solid and 1–3 cm in diameter. The leaves are about 1.5 m long and 8 cm wide and often covered with small hairs. The grains grow at the top of the plants with many packed together in a stretched-out cone shape. Pearl millet grains are 2–5.5 mm long and can be pearly white, yellow, grey-blue, brown, or even purple ^[1,2].

Growth form grass, terrestrial herb ^[1]
Life cycle annual
Centre of origin West Africa
Stress Tolerance Very tolerant to poor soils and drought ^[2]

DISTRIBUTION RANGE



Geographic locations where species has been reported to occur



English name
pearl millet

Scientific name
Pennisetum glaucum L.

Local names
mhunga · Zimbabwe
pearl millet · Zambia

ETHNOBOTANICAL INFORMATION

Pearl millet is a staple food for many people in tropical Africa and India. There are many ways to cook and eat the seeds, such as making couscous, candy, or beer. A very common preparation method is to pound them into flour which is then boiled into porridge or baked into flat bread. The stems of the plant are used for construction purposes, as fuel, and as animal food. The plant is also used for a number of medicinal applications throughout Africa ^[1,2].

Occurring in farming systems in	Zimbabwe	Zambia
Level of domestication	domesticated	domesticated
Considered a NUS	yes	yes
Edible parts	seeds	seeds
Contribution to food group(s)	nuts, seeds and legumes	nuts, seeds and legumes
Popular ways of preparation or preservation	boiled, fried or stir-fried	raw, boiled, dried or dehydrated
Growth place	agricultural field, roadside, other	agricultural field, home garden
Commercialization	no	no

NUTRITIONAL INFORMATION

Nutrition item	Pearl millet, seeds ^[A]
Protein (grams)	3.04
Reference	[3]

Nutrition information is indicated per 100g of food plant item.
Nutrients for which no information was found: Energy (kcal), Fiber (grams), Thiamine (mg), Riboflavin (mg), Niacin (mg NE), Vitamin B6 (mg), Pantothenate (ug), Biotine (ug), Folate (ug DFE), Vitamin C (mg), Vitamin A (ug RAE or RE), Vitamin D (ug), Vitamin E (mg), Vitamin K (ug), Calcium (mg), Magnesium (mg), Zinc (mg), Iron (mg), Iodine (ug), Selenium (ug), Copper (ug), Manganese (ug), Sodium (g), Potassium (mg), Phosphorus (mg)

PERILLA FRUTESCENS L.

English name
perilla ^[1]

Scientific name
Perilla frutescens L.

Local names
सल्लिम · Nepal

Transliterated names
silam, bhangiro · Nepal

BOTANICAL INFORMATION

An annual herb of 0.3–2 m tall with a strong smell. Both green and purple plants exist. The stem is square-shaped, 0.5–1.5 cm in diameter, and covered with hair. The leaves are round to oval in shape with a pointy tip and toothed leaf edges, 2–13 cm long and 1.5–10 cm wide, and grow in pairs on opposite sides of the stem, with each next set of leaves being placed perpendicular to the previous one. The lower leaves on the plant are bigger than the leaves higher up on the plant. The flowers grow with many together in a spike of 2–20 cm long at the top of the plant and from the base of the leaves. The flowers are white, purple, or purple-red and up to 11 mm long. Each flower develops into four grey-brown to black-brown round seeds of 1–2 mm in diameter ^[1].

Growth form terrestrial herb
Life cycle annual
Centre of origin India and/or China ^[1]

DISTRIBUTION RANGE



Geographic locations where species has been reported to occur

NUTRITIONAL HIGHLIGHTS



- Protein
- Fiber
- Thiamine
- Riboflavin
- Vitamin E



- Magnesium
- Zinc
- Iron
- Phosphorus

- Protein
- Calcium
- Magnesium
- Zinc

- Iron
- Copper
- Manganese
- Phosphorus

ETHNOBOTANICAL INFORMATION

The leaves, flowers, seeds, and sprouts are all edible and used mainly in small amounts for their taste. The leaves can be dried and stored for a long time. The plant is also used medicinally to counter inflammation ^[1].

Occurring in farming systems in	Nepal
Level of domestication	domesticated
Considered a NUS	yes
Edible parts	seeds
Contribution to food group(s)	legumes, nuts and seeds
Popular ways of preparation or preservation	fried or stir-fried

NUTRITIONAL INFORMATION

Nutrition item	Perilla leaves, dried, powder ^[A]	Perilla seeds ^[B]
Energy (kcal)	323	
Protein (grams)	22 ●	25.38 ●
Fiber (grams)	29.4 ●	
Thiamine (mg)	0.53 ●	
Riboflavin (mg)	0.86 ●	
Vitamin C (mg)	6	
Vitamin E (mg)	38.8 ●	
Vitamin K (ug)	4.86	
Calcium (mg)	1.59	249.9 ●
Magnesium (mg)	287 ●	261.7 ●
Zinc (mg)	4.69 ●	4.22 ●
Iron (mg)	45.4 ●	9.54 ●
Copper (ug)		0.2 ●
Manganese (ug)		5 ●
Sodium (g)	0	
Potassium (mg)	1.38	
Phosphorus (mg)	382 ●	677.2 ●
Reference	[2]	[2]

Nutrition information is indicated per 100g of food plant item.

^[A] Leaf, dried, powder ^[B] Perilla seeds

Nutrients for which no information was found: Niacin (mg NE), Vitamin B6 (mg), Pantothenate (ug), Biotine (ug), Folate (ug DFE), Vitamin A (ug RAE or RE), Vitamin D (ug), Iodine (ug), Selenium (ug)



PHASEOLUS COCCINEUS L.

BOTANICAL INFORMATION

A perennial herb that can either grow as a climber with stems up to 4 m long, or more bushy up to 60 cm tall. The plant is often grown as an annual. The shoots of perennial plants die off during colder periods and grow again later in the year from a tuberous root. The leaves are composed of three smaller leaflets, which are shaped like wide arrow points and which are 6.5–10.5 cm long and 5–8.5 cm wide. The three leaflets grow at the end of a leafstalk of 8.5–10.5 cm long. The flowers are bright red, up to 2.5 cm long and 1.5 cm wide, and grow with many together at the end of a branch or from the base of the leaves. The fruits are flat and straight or slightly curved bean pods 9–13 cm long and 1.5–2.5 cm wide. The fruits contain 3–5 seeds which are 13–25 mm long and 6–13 mm wide and are coloured black, white, or brown, often with pink or purple spots on them ^[1].

Growth form terrestrial herb
 Life cycle perennial ^[1]
 Centre of origin Central America ^[1]
 Stress Tolerance Does not tolerate temperatures below 5°C and does not grow many fruits above 25°C. Does not tolerate drought ^[1].

DISTRIBUTION RANGE



Geographic locations where species has been reported to occur

NUTRITIONAL HIGHLIGHTS



- Protein
- Fiber
- Thiamine
- Vitamin B6
- Folate
- Zinc
- Iron
- Potassium
- Phosphorus
- Protein
- Fiber

ETHNOBOTANICAL INFORMATION

Almost all parts of the runner bean are edible. The flowers, young shoots, leaves, and young fruits can be eaten boiled or fried. When the fruits mature they get quite fibrous and become less tasty. The mature fruits however store seeds which are very nutritious after they are cooked. The plant furthermore has thick tuberous roots which are also edible after boiling. The plant can be fed to livestock and is grown as an ornamental plant for its beautiful flowers ^[1,2].

Occurring in farming systems in	Guatemala
Level of domestication	wild
Considered a NUS	yes
Edible parts	leaves, flowers, seeds
Contribution to food group(s)	vegetables, legumes, nuts and seeds
Popular ways of preparation or preservation	boiled
Growth place	agricultural field, home garden
Commercialization	yes

NUTRITIONAL INFORMATION

Nutrition item	Bean, dried ^[A]	Bean, raw ^[B]
Energy (kcal)	328	
Protein (grams)	22.8 ●	21.65 ●
Fiber (grams)	16.4 ●	5.97 ●
Thiamine (mg)	0.3 ●	
Riboflavin (mg)	0.11	
Niacin (mg NE)	2.1	
Vitamin B6 (mg)	0.4 ●	
Folate (ug DFE)	394 ●	
Vitamin A (ug RAE or RE)	1	
Calcium (mg)	128	
Zinc (mg)	2.79 ●	
Iron (mg)	5.4 ●	
Sodium (g)	0	
Potassium (mg)	1359 ●	
Phosphorus (mg)	328 ●	
Reference	[3]	[4]

Nutrition information is indicated per 100g of food plant item.

^[A] Frijol Cuba o Piloy, grano seco ^[B] Petaco bean, seeds, raw

Nutrients for which no information was found: Pantothenate (ug), Biotine (ug), Vitamin C (mg), Vitamin D (ug), Vitamin E (mg), Vitamin K (ug), Magnesium (mg), Iodine (ug), Selenium (ug), Copper (ug), Manganese (ug)



PHYLLOGEITON DISCOLOR^{L.}

English name
bird plum

Scientific name
Phyllogeiton discolor L.

Local names
nyii, umnyi - Zimbabwe

BOTANICAL INFORMATION

A tree growing up to 20 m high with a straight stem and a flaky dark grey bark. The leaves are oval, shiny above and dull greyish underneath, 2-9 cm long and 2-5 cm wide, and are alternate to almost oppositely positioned on the branches. The small round flowers are 4-5 mm in diameter and are green when young and yellow when older. The yellow fruits are date-like, up to 2 cm long and 1 cm wide, with 1-2 flat seeds inside ^[1].

Growth form tree
Life cycle perennial
Centre of origin Sub-Saharan Africa

DISTRIBUTION RANGE



Geographic locations where species has been reported to occur

NUTRITIONAL HIGHLIGHTS



- Vitamin C
- Copper

ETHNOBOTANICAL INFORMATION

The fruits of this plant are very sweet and can be eaten raw, boiled as porridge, or deseeded, dried, and ground into flour to make cakes. The fruits are also fermented to make an alcoholic beverage. The wood is very suitable for construction purposes and used for making tools and furniture. The roots, wood, roots, and bark are furthermore boiled together with baskets to dye them in colors ranging from orange to brown to black ^[1].

Occurring in farming systems in	Zimbabwe
Level of domestication	wild
Considered a NUS	yes
Edible parts	fruits
Contribution to food group(s)	fruits
Popular ways of preparation or preservation	raw
Growth place	forest
Commercialization	no

NUTRITIONAL INFORMATION

Nutrition item	Bird-plum, fruit flesh, raw ^[a]
Protein (grams)	1.1
Fiber (grams)	2.8
Thiamine (mg)	0.03
Riboflavin (mg)	0.06
Vitamin C (mg)	50.3 ●
Calcium (mg)	88.6
Magnesium (mg)	30.9
Zinc (mg)	0.27
Iron (mg)	2.24
Copper (ug)	0.2 ●
Sodium (g)	0
Potassium (mg)	270
Phosphorus (mg)	40.1
Reference	[2]

Nutrition information is indicated per 100g of food plant item.

^[a] Bird-plum/ Brown ivory, fruit flesh, raw

Nutrients for which no information was found: Energy (kcal), Niacin (mg NE), Vitamin B6 (mg), Pantothenate (ug), Biotine (ug), Folate (ug DFE), Vitamin A (ug RAE or RE), Vitamin D (ug), Vitamin E (mg), Vitamin K (ug), Iodine (ug), Selenium (ug), Manganese (ug)



PHYSALIS PERUVIANA L.

BOTANICAL INFORMATION

A perennial herb of 0.5–2 m tall with purplish branches and many small hairs. The leaves are more or less oval with a pointy tip, 5–15 cm long and 4–10 cm wide, and grow on leafstalks of roughly the same length as the leaf. The flowers hang down and are bell-shaped, 2 cm in diameter, and are colored yellow with 5 dark purple spots on the inside. The flowers grow on their own at the base of the leaves. The fruit is a round, yellow–orange berry of 1–2 cm in diameter and is enclosed in a papery outside husk ^[1].

Growth form terrestrial herb ^[1]
Life cycle perennial
Centre of origin Andes

DISTRIBUTION RANGE



Geographic locations where species has been reported to occur

NUTRITIONAL HIGHLIGHTS



- Fiber
- Thiamine
- Vitamin C
- Copper



ETHNOBOTANICAL INFORMATION

The orange–yellow fruits are often eaten fresh or sometimes cooked to make deserts, chutneys, or jam. The leaves have several medical uses ^[1]. Nowadays it is marketed across the globe.

Occurring in farming systems in	Peru
Level of domestication	domesticated
Considered a NUS	yes
Edible parts	fruits
Contribution to food group(s)	fruits
Popular ways of preparation or preservation	raw
Growth place	home garden
Commercialization	no, although commercial production for export is practiced

NUTRITIONAL INFORMATION

Nutrition item	Golden berry, fruit, raw ^[A]
Protein (grams)	2.3
Fiber (grams)	3.6 ●
Thiamine (mg)	0.24 ●
Riboflavin (mg)	0.15
Niacin (mg NE)	1.68
Vitamin C (mg)	42 ●
Calcium (mg)	10.5
Magnesium (mg)	34.8
Zinc (mg)	0.38
Iron (mg)	2.37
Copper (ug)	0.36 ●
Sodium (g)	0
Potassium (mg)	496
Phosphorus (mg)	61.5
Reference	^[2]

Nutrition information is indicated per 100g of food plant item.

^[A] Cape gooseberry/ Inca berry/ Aztec berry/ golden berry/ giant ground cherry/ Peruvian groundcherry/ Peruvian cherry, whole fruit, raw

Nutrients for which no information was found: Energy (kcal), Vitamin B6 (mg), Pantothenate (ug), Biotine (ug), Folate (ug DFE), Vitamin A (ug RAE or RE), Vitamin D (ug), Vitamin E (mg), Vitamin K (ug), Iodine (ug), Selenium (ug), Manganese (ug)

PILIOSTIGMA MALABARICUM L.

BOTANICAL INFORMATION

A tree growing up to 17 m tall, with often a gnarled and short bole. The bark of the tree peels off in long strips and is yellow-brown in color. Each leaf consists of two oval leaflets that grow together at the leaf base up to 4/5th the length of the leaf before they split. The leaves are 4-12 cm long and 5-16 cm wide, smooth and green above and hairy and dull greyish below. The flower buds are 2-5 cm long and grow closely together. The flowers are pale yellow-white in color and have five petals growing up to 2 cm long. The brown fruit is shaped like a bean, 17-35 cm long and 2-2.5 cm wide, containing 10-30 seeds ^[1].

Growth form tree
Life cycle perennial
Centre of origin South East Asia

DISTRIBUTION RANGE



Geographic locations where species has been reported to occur

NUTRITIONAL HIGHLIGHTS



- Protein
- Fiber
- Calcium
- Iron

ETHNOBOTANICAL INFORMATION

The young leaves and shoots are used as both condiment and vegetable and are cooked with other foods for their pleasantly sour smell and taste. The fibers from the bark are used to make rope and the wood is used for making indoor furniture and is regarded as good firewood ^[1,2].

Occurring in farming systems in	Laos
Level of domestication	wild
Considered a NUS	yes
Edible parts	leaves
Contribution to food group(s)	vegetables
Popular ways of preparation or preservation	raw, steamed
Growth place	forest
Commercialization	no

NUTRITIONAL INFORMATION

Nutrition item	Leaves, dehydrated, powder
Energy (kcal)	365
Protein (grams)	15.19 ●
Fiber (grams)	4.26 ●
Vitamin C (mg)	4.5
Calcium (mg)	240 ●
Iron (mg)	21.73 ●
Reference	[3]

Nutrition information is indicated per 100g of food plant item.

Nutrients for which no information was found: Thiamine (mg), Riboflavin (mg), Niacin (mg NE), Vitamin B6 (mg), Pantothenate (ug), Biotine (ug), Folate (ug DFE), Vitamin A (ug RAE or RE), Vitamin D (ug), Vitamin E (mg), Vitamin K (ug), Magnesium (mg), Zinc (mg), Iodine (ug), Selenium (ug), Copper (ug), Manganese (ug), Sodium (g), Potassium (mg), Phosphorus (mg)



PINUS ROXBURGHII L.

BOTANICAL INFORMATION

A perennial coniferous tree growing up to 55 m high with a stem of up to 30 cm in diameter. The bark is dark red-brown with deep vertical cracks and scales. The needle-shaped leaves are grouped with 3 together. The cones have the shape of an egg and are 10-15 cm long and 6-9 cm wide. The seeds are 8-12 mm long with a 2.5 mm long wing^[2].

Growth form tree
Life cycle perennial
Centre of origin Himalaya^[1]

DISTRIBUTION RANGE



Geographic locations where species has been reported to occur

ETHNOBOTANICAL INFORMATION

The seeds of the long-leaved Indian pine are edible and rich in oil. The wood of the tree is used for construction purposes and as firewood and the cones are used as a fire starter. The tree is also used medicinally: the resin that is tapped from the stem is used to treat cough and the twigs are used to treat asthma^[2].

Occurring in farming systems in	Nepal
Level of domestication	wild
Considered a NUS	yes
Edible parts	seeds
Contribution to food group(s)	legumes, nuts and seeds
Popular ways of preparation or preservation	fried or stir-fried

No nutritional information was found for *Pinus roxburghii*



English name
long-leaved Indian pine^[1]

Scientific name
Pinus roxburghii L.

Local names
समिता/सल्लाको फल · Nepal

Transliterated names
simta · Nepal

PRUNUS SEROTINA L.

SUBSP. CAPULI

BOTANICAL INFORMATION

A perennial tree that can grow up to 40 meters in height but which is usually smaller. The leaves are oval in shape with a pointy tip, glossy, and 8–12 cm long and 2–5 cm wide. The flowers are white, 4–8 mm in diameter, and grow with 18–55 together in standing or hanging spikes of 15 cm or longer. The fruits are round, 2–2.5 cm in diameter, and have a shiny purple black skin and purple red flesh, and a single seed inside ^[2, 3].

Growth form tree
 Life cycle perennial
 Centre of origin Central and South America ^[1]

DISTRIBUTION RANGE



Geographic locations where species has been reported to occur

NUTRITIONAL HIGHLIGHTS



● Fiber



● Protein
 ● Fiber
 ● Calcium
 ● Magnesium
 ● Zinc

● Iron
 ● Potassium
 ● Phosphorus



● Protein
 ● Fiber
 ● Magnesium
 ● Zinc
 ● Phosphorus

ETHNOBOTANICAL INFORMATION

There are various subspecies of *Prunus serotina*, with similar characteristics. The fruits of the capuli subspecies are relatively large and are eaten fresh, dried, or made into drinks. The wood is valued for carpentry and used as firewood ^[1, 4].

Occurring in farming systems in	Peru
Level of domestication	wild
Considered a NUS	yes
Edible parts	fruits
Contribution to food group(s)	fruits
Popular ways of preparation or preservation	raw
Growth place	home garden, forest
Commercialization	no

NUTRITIONAL INFORMATION

Nutrition item	Capuli fruit	Capuli seeds, raw	Capuli seeds, roasted
Protein (grams)	2.1	37 ●	36.55 ●
Fiber (grams)	3.58 ●	10.73 ●	12.12 ●
Calcium (mg)	12.9	192.3 ●	127.11
Magnesium (mg)	21.2	249.15 ●	216.68 ●
Zinc (mg)		3.4 ●	2.96 ●
Iron (mg)		9.49 ●	1.21
Sodium (g)	0	0	0
Potassium (mg)	184.3	873.22 ●	454.82
Phosphorus (mg)	28.1	439 ●	323.4 ●
Reference	[5]	[5]	[5]

Nutrition information is indicated per 100g of food plant item.

Nutrients for which no information was found: Energy (kcal), Thiamine (mg), Riboflavin (mg), Niacin (mg NE), Vitamin B6 (mg), Pantothenate (ug), Biotine (ug), Folate (ug DFE), Vitamin C (mg), Vitamin A (ug RAE or RE), Vitamin D (ug), Vitamin E (mg), Vitamin K (ug), Iodine (ug), Selenium (ug), Copper (ug), Manganese (ug)



PSIDIUM GUAJAVA L.

BOTANICAL INFORMATION

A perennial tree growing up to 10 m tall. The bark is smooth and flakes off, giving it a colorful pattern of red-brown and green colors. The leaves are oval with a blunt pointy tip, have prominent veins, and are 5-15 cm long and 3-7 cm wide. The leaves grow in pairs opposite of each other on the branches. The flowers are 3 cm in diameter, white, with 4-5 petals and many 1-2 cm long stamens, which are the male flower parts in the center of a flower that look like strings. The flowers grow alone or with 3 together at the base of the leaves. The fruit is round to egg-shaped, 4-12 cm long, with a green-yellow skin and whitish-yellow, pink or red flesh. The fruits contain many hard yellow kidney-shaped seeds 3-5 mm long ^[1].

Growth form	tree
Life cycle	perennial
Centre of origin	American tropics ^[1]
Stress Tolerance	More tolerant to drought than many other tropical species and can grow in a wide range of temperatures ^[1] .

DISTRIBUTION RANGE



Geographic locations where species has been reported to occur

NUTRITIONAL HIGHLIGHTS



- Fiber
- Vitamin B6
- Vitamin C
- Manganese

ETHNOBOTANICAL INFORMATION

The guava fruits can be eaten raw when they are still green and also when they are ripe. The fruit pulp is also used to make various sweets, such as cakes and jelly. The leaves are used as a medicine against diarrhea and the wood is used for carpentry ^[1].

Occurring in farming systems in	Zambia
Level of domestication	domesticated
Considered a NUS	no
Edible parts	fruits
Contribution to food group(s)	fruits
Popular ways of preparation or preservation	raw
Growth place	home garden
Commercialization	no

NUTRITIONAL INFORMATION

Nutrition item	Guava fruit
Energy (kcal)	71
Protein (grams)	0.8
Fiber (grams)	7.8 ●
Thiamine (mg)	0.05
Riboflavin (mg)	0.02
Niacin (mg NE)	1.2
Vitamin B6 (mg)	0.79 ●
Folate (ug DFE)	19
Vitamin C (mg)	341 ●
Vitamin A (ug RAE or RE)	5
Vitamin D (ug)	0
Vitamin E (mg)	0.72
Calcium (mg)	7
Magnesium (mg)	18
Zinc (mg)	0.2
Iron (mg)	0.4
Copper (ug)	0.1
Manganese (ug)	90 ●
Sodium (g)	0
Potassium (mg)	282
Phosphorus (mg)	28
Reference	[2]

Nutrition information is indicated per 100g of food plant item.

Nutrients for which no information was found: Pantothenate (ug), Biotine (ug), Vitamin K (ug), Iodine (ug), Selenium (ug)



RAPHANUS SATIVUS L.

BOTANICAL INFORMATION

An annual herb of 20–100 cm tall with a swollen root. The shape of the root differs depending on the variety from round to long, and is white, red, or sometimes grey. The stem is short at first but grows long when the plant is about to flower. The leaves low on the plant grow in a circle near the ground, with a leafstalk of 3–5.5 cm long and a leaf blade of 5–30 cm long with several lobes. The leaves higher up on the plant are much thinner and smaller. The flowers are 1.5 cm in diameter, with 4 white to pink-purple petals that are arranged in a cross shape, and grow with multiples together at the top of the plant. The fruit is shaped like a cylinder with a pointy tip, up to 10 cm long and 1.5 cm wide, and contains 2–12 round seeds of 3 mm in diameter ^[1].

Growth form terrestrial herb
Life cycle annual
Centre of origin Mediterranean
Stress Tolerance Needs cool temperatures and day length of less than 15 hours ^[1].

DISTRIBUTION RANGE



Geographic locations where species has been reported to occur



Raphanus sativus

ETHNOBOTANICAL INFORMATION

Radish is a major crop around the world and many varieties exist with different features. Most varieties are grown for the fleshy root, which has a pungent flavor and can be eaten either raw or boiled. The leaves and young seed pods are also edible raw or cooked ^[1].

Occurring in farming systems in	Guatemala
Level of domestication	domesticated
Considered a NUS	no
Edible parts	roots/tubers, leaves
Contribution to food group(s)	tuber and roots, vegetables
Popular ways of preparation or preservation	raw
Growth place	agricultural field, home garden
Commercialization	yes

NUTRITIONAL INFORMATION

Nutrition item	Radish leaves, cooked
Energy (kcal)	60
Thiamine (mg)	0.02
Riboflavin (mg)	0
Zinc (mg)	0.36
Iron (mg)	0.41
Copper (ug)	0.01
Reference	[2]

Nutrition information is indicated per 100g of food plant item.
Nutrients for which no information was found: Protein (grams), Fiber (grams), Niacin (mg NE), Vitamin B6 (mg), Pantothenate (ug), Biotine (ug), Folate (ug DFE), Vitamin C (mg), Vitamin A (ug RAE or RE), Vitamin D (ug), Vitamin E (mg), Vitamin K (ug), Calcium (mg), Magnesium (mg), Iodine (ug), Selenium (ug), Manganese (ug), Sodium (g), Potassium (mg), Phosphorus (mg)

RHOICISSUS TOMENTOSA L.

BOTANICAL INFORMATION

A perennial climber with woody rope-like stems that climbs up to 20 meters high. Sometimes the plant grows more like a small tree of 3–7 m tall. The bark is grey and the young branches, tendrils, and underside of the leaves are covered in rusty hairs. The leaves are round to kidney-shaped, 9–20 cm long and 7–16 cm wide and the leaf edge is often a little wavy or shallowly lobed. The flowers are small, creamy green, and grow with many densely together in clusters at the base of the leaves. The fruits are up to 20 mm in diameter and look like grapes, with a skin that is green when young and purple-black when ripe, and with whitish flesh inside^[1,2].

Growth form climber^[1]
Life cycle perennial
Centre of origin southern Africa^[1]

DISTRIBUTION RANGE



Geographic locations where species has been reported to occur

NUTRITIONAL HIGHLIGHTS



- Fiber
- Copper
- Manganese

ETHNOBOTANICAL INFORMATION

The fruits of the African grape are eaten raw or made into jam and wine^[1,2].

Occurring in farming systems in	Zambia
Level of domestication	wild
Considered a NUS	yes
Edible parts	fruits
Contribution to food group(s)	fruits
Popular ways of preparation or preservation	raw
Growth place	forest
Commercialization	no

NUTRITIONAL INFORMATION

Nutrition item	Grape, fresh ^[A]
Energy (kcal)	35.54
Protein (grams)	0.98
Fiber (grams)	16.32 ●
Vitamin C (mg)	3.74
Calcium (mg)	49.1
Magnesium (mg)	16.3
Zinc (mg)	0.4
Iron (mg)	1.02
Copper (ug)	0.26 ●
Manganese (ug)	2 ●
Sodium (g)	0
Potassium (mg)	147.84
Phosphorus (mg)	14.18
Reference	[3]

^[a] Sim fruit, fresh

Nutrition information is indicated per 100g of food plant item.

Nutrients for which no information was found: Thiamine (mg), Riboflavin (mg), Niacin (mg NE), Vitamin B6 (mg), Pantothenate (ug), Biotine (ug), Folate (ug DFE), Vitamin A (ug RAE or RE), Vitamin D (ug), Vitamin E (mg), Vitamin K (ug), Iodine (ug), Selenium (ug)



SECHIUM EDULE L.

BOTANICAL INFORMATION

A perennial climber that can grow up to 15 m per growing season. The leaves are 7-25 cm in diameter, roughly round with 3-7 lobes, and grow on a leafstalk of 3-25 cm long. At the base of most leaves grows a tendril with 2-5 branches which curls around other things close by to help the plant climb up. The flowers also grow at the base of the leaves with several together and are whitish-green with 5 petals. The fruits are pear-shaped, 7-20 cm long, often grooved, and sometimes covered with soft spines. They have a whitish to dark green skin and a pulpy inside which is greenish-white. Every fruit contains a single flattened white oval seed of 2.5-5 cm long ^[1].

Growth form climber
 Life cycle perennial ^[1]
 Centre of origin Central America ^[1]
 Stress Tolerance Needs high relative humidity (80–85%), annual rainfall of at least 1500–2000 mm and average temperatures of 20–25°C to produce fruits ^[1].

DISTRIBUTION RANGE



Geographic locations where species has been reported to occur



English name
chayote, chow chow

Scientific name
Sechium edule L.

Local names
guisquil, chayote · Guatemala
सकुस · Nepal

Transliterated names
skush · Nepal

ETHNOBOTANICAL INFORMATION

All parts of the chayote are edible but most often the fruits are eaten. The fruits, which are popular in Latin America, are eaten before they are fully ripe and are best when cooked. The cooked leaves, shoots, seeds, and tuberous roots are also edible. Fibers that are extracted from the stem are used for making hats and baskets ^[1].

Occurring in farming systems in	Guatemala	Nepal
Level of domestication	wild	domesticated
Considered a NUS	yes	yes
Edible parts	roots/tubers, leaves, fruits, meristems	roots/tubers, fruits
Contribution to food group(s)	tubers and roots, vegetables, fruits	tubers and roots, fruits
Popular ways of preparation or preservation	boiled	boiled, fried or stir-fried
Growth place	agricultural field, home garden, roadside	-
Commercialization	yes	-

NUTRITIONAL INFORMATION

Nutrition item	Chayote, raw	Chayote, boiled	Chayote, cooked
Energy (kcal)		21	
Protein (grams)		0.6	
Fiber (grams)	1.1	1.1	0.9
Thiamine (mg)		0.02	
Riboflavin (mg)		0.02	
Niacin (mg NE)		0.4	
Vitamin B6 (mg)		0.1	
Folate (ug DFE)		15	
Vitamin A (ug RAE or RE)		3	
Calcium (mg)	30	24	41
Magnesium (mg)	26		16
Zinc (mg)		0.26	
Iron (mg)	2	0.4	1
Potassium (mg)	316		81
Phosphorus (mg)	70		45
Reference	^[2]	^[3]	^[2]

Nutrition information is indicated per 100g of food plant item.
 Nutrients for which no information was found: Vitamin B6 (mg), Pantothenate (ug), Biotine (ug), Vitamin C (mg), Vitamin D (ug), Vitamin E (mg), Vitamin K (ug), Iodine (ug), Selenium (ug), Copper (ug), Manganese (ug), Sodium (g)

SENNA OBTUSIFOLIA L.

English name
sicklepod

Scientific name
Senna obtusifolia L.

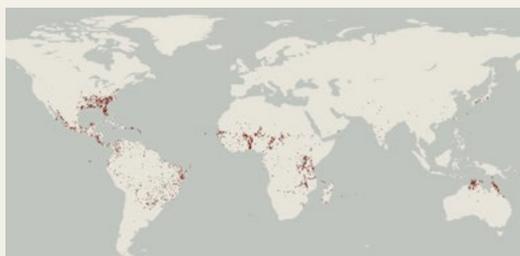
Local names
oyedo · Uganda Pelum

BOTANICAL INFORMATION

An annual herb that can grow up to 2 m tall. The leaves are composed of 6 smaller leaflets that grow in pairs opposite of each other. The leaflets are more or less egg-shaped and 1.5-5 cm long. The flowers are yellow with 5 petals 1-2 cm long and grow alone or with 2 together at the base of the leaves. The fruits are bean-like pods, up to 23 cm long and 0.5 cm wide, and contain many rectangular 5 mm long seeds ^[1].

Growth form terrestrial herb
Life cycle annual
Centre of origin South America

DISTRIBUTION RANGE



Geographic locations where species has been reported to occur

NUTRITIONAL HIGHLIGHTS



● Protein



● Protein



- Protein
- Fiber
- Thiamine
- Calcium
- Magnesium
- Zinc
- Iron
- Copper
- Potassium
- Phosphorus

ETHNOBOTANICAL INFORMATION

The young leaves of the sicklepod are edible and used in various dishes. Older leaves should not be eaten in large quantities as this will cause diarrhea. The seeds can also be eaten in small amounts after they are cooked. The leaves are used medicinally as a laxative, to get rid of parasitic worms and to treat skin disorders. The leaves, roots, and seeds are furthermore used to make black, blue, orange, and yellow dyes ^[1].

Occurring in farming systems in	Uganda
Level of domestication	wild
Considered a NUS	yes
Edible parts	leaves
Contribution to food group(s)	vegetables
Popular ways of preparation or preservation	boiled
Growth place	home garden, forest, other
Commercialization	no

NUTRITIONAL INFORMATION

Nutrition item	Sicklepod leaves, fresh	Sicklepod seeds, fresh	Sicklepod seeds, dried, powder
Energy (kcal)			325,28
Protein (grams)	5.42 ●	18.46 ●	29.54 ●
Fiber (grams)	2.6	0.2	10.18 ●
Thiamine (mg)			0.6 ●
Riboflavin (mg)			0.1
Niacin (mg NE)			1.85
Vitamin C (mg)			11.88
Calcium (mg)	0.26	0.19	960 ●
Magnesium (mg)			640 ●
Zinc (mg)			53.12 ●
Iron (mg)			234.6 ●
Selenium (ug)			0.03
Copper (ug)	0.01	0.01	10.48 ●
Manganese (ug)	0	0	
Sodium (g)	0	0	0
Potassium (mg)			1200 ●
Phosphorus (mg)			810 ●
Reference	[2]	[2]	[2]

Nutrition information is indicated per 100g of food plant item.

Nutrients for which no information was found: Vitamin B6 (mg), Pantothenate (ug), Biotine (ug), Folate (ug DFE), Vitamin A (ug RAE or RE), Vitamin D (ug), Vitamin E (mg), Vitamin K (ug), Iodine (ug)



SESAMUM INDICUM L.

BOTANICAL INFORMATION

An annual herb of 0.5-2 m tall with a firm square stem and aromatic leaves. There is a lot of variation in the size and shape of the leaves. The lower leaves grow in pairs on opposite sides of the stem, with each next set of leaves perpendicular to the previous one, and have leafstalks of up to 17 cm and an oval leaf blade of 10-21 cm long and 5-13 cm wide. The leaves in the middle of the plant are often divided into three smaller leaflets. The leaves higher on the plant grow in a spiral pattern around the branches in a cross shape and have very small leafstalks and narrow leaf blades 5-15 cm long and 1-3 cm wide. The flowers are white or violet and often with yellow spots, and bell-shaped, 2-3.5 cm long and 1.5-2.5 cm wide. The flowers grow alone or with a few together at the base of the leaves. The fruits are 1.5-3 cm long and 0.5-1 cm wide and rectangular in shape with several deep grooves that run along the length of the fruit. Inside the fruits are many seeds, which are yellowish-white, grey, brown, or black and have a flattened oval shape of 2-3 mm long and 0.5-1 mm thick ^[1].

Growth form	terrestrial herb
Life cycle	annual
Centre of origin	Africa to South Asia ^[1]
Stress Tolerance	A drought tolerant plant that prefers temperatures above 20°C ^[1] .

DISTRIBUTION RANGE



Geographic locations where species has been reported to occur

NUTRITIONAL HIGHLIGHTS



- Protein
- Thiamine
- Riboflavin
- Niacin
- Vitamin B6
- Folate
- Zinc
- Iron

ETHNOBOTANICAL INFORMATION

Sesame is one of the earliest cultivated crops and is used around the world. The seeds can be eaten raw, roasted, or dried. They can also be ground to make a paste commonly known as tahini or to extract their oil, which is used for cooking and cosmetics ^[1].

Occurring in farming systems in	Laos	Uganda
Level of domestication	domesticated	domesticated
Considered a NUS	no	yes
Edible parts	seeds	seeds
Contribution to food group(s)	legumes, nuts and seeds	legumes, nuts and seeds
Popular ways of preparation or preservation	fried or stir-fried	dried or dehydrated
Growth place	agricultural field	agricultural field, home garden, other
Commercialization	no	yes

NUTRITIONAL INFORMATION

Nutrition item	Sesame seeds, roasted
Energy (kcal)	682
Protein (grams)	26.1 ●
Thiamine (mg)	0.83 ●
Riboflavin (mg)	1.54 ●
Niacin (mg NE)	5 ●
Vitamin B6 (mg)	0.8 ●
Folate (ug DFE)	98.3 ●
Vitamin C (mg)	0
Vitamin A (ug RAE or RE)	0
Calcium (mg)	90
Zinc (mg)	7.18 ●
Iron (mg)	13 ●
Reference	^[2]

Nutrition information is indicated per 100g of food plant item.

Nutrients for which no information was found: Fiber (grams), Pantothenate (ug), Biotine (ug), Vitamin D (ug), Vitamin E (mg), Vitamin K (ug), Calcium (mg), Magnesium (mg), Iodine (ug), Selenium (ug), Copper (ug), Manganese (ug), Sodium (g), Potassium (mg), Phosphorus (mg)



SESAMUM SESAMOIDES L.

BOTANICAL INFORMATION

An annual herb growing up to 1 m tall. The lower part of the plant is sometimes woody and the stems are covered in small hairs. The leaves are shaped like an arrowpoint, are 1.5-8 cm long and 0.5-4.5 cm wide, slightly hairy on the underside, and are positioned on opposite sides of the branches. Lower leaves have a leafstalk up to 6 cm, whereas the leaves growing higher on the plant have very short leafstalks. The flowers are pink-purple, shaped like a tube, 1.5-4 cm long, and grow solitary from the base of the leaves. The fruit is a 1-2 cm long brown capsule with angular edges and contains many seeds. The seeds are 2.5-4 mm long and 2-2.5 mm wide and black ^[1].

Growth form terrestrial herb
 Life cycle annual
 Centre of origin Sub-Saharan Africa

DISTRIBUTION RANGE



Geographic locations where species has been reported to occur

NUTRITIONAL HIGHLIGHTS



● Protein



● Protein
 ● Vitamin C
 ● Iron

ETHNOBOTANICAL INFORMATION

False sesame is found in the wild or sometimes cultivated, mainly in sub-Saharan Africa. The leaves and flowers of false sesame are edible and are often boiled and used in sauces or stir-fried. The seeds are also edible and ground to make a paste or cooking oil. The plant furthermore serves as fodder for livestock and is also used medicinally, most importantly for treating diarrhea and conjunctivitis ^[1].

Occurring in farming systems in	Zambia
Level of domestication	wild
Considered a NUS	yes
Edible parts	leaves
Contribution to food group(s)	vegetables
Popular ways of preparation or preservation	boiled, fried or stir-fried
Growth place	forest
Commercialization	no

NUTRITIONAL INFORMATION

Nutrition item	Sesame seeds, raw	Sesame leaves, raw
Energy (kcal)	492	65
Protein (grams)	19.24 ●	5.25 ●
Vitamin C (mg)		59.25 ●
Calcium (mg)	1.32	0.63
Zinc (mg)		0.11
Iron (mg)		19.69 ●
Reference	[2]	[2]

Nutrition information is indicated per 100g of food plant item.

νNutrients for which no information was found: Fiber (grams), Thiamine (mg), Riboflavin (mg), Niacin (mg NE), Vitamin B6 (mg), Pantothenate (ug), Biotin (ug), Folate (ug DFE), Vitamin A (ug RAE or RE), Vitamin D (ug), Vitamin E (mg), Vitamin K (ug), Magnesium (mg), Iodine (ug), Selenium (ug), Copper (ug), Manganese (ug), Sodium (g), Potassium (mg), Phosphorus (mg)



SETARIA ITALICA L.

BOTANICAL INFORMATION

An annual grass of 60-120 cm tall. The leaves are 16-32 cm long and 1.5-2.5 cm wide and have a clear line running through the middle. The seeds grow with many together in clusters at the top of the plant. The clusters are packed together in a large spike of 8-18 cm long and 1-2 cm in diameter, which can either grow up straight or bend down. The seeds are oval, up to 2 mm long, and colored pale yellow to orange, red, brown, or black ^[1].

Growth form grass, terrestrial herb ^[1]
Life cycle annual
Centre of origin China ^[1]
Stress Tolerance Tolerant to drought (125 mm of rain during the growing season) and poor soils ^[1].

DISTRIBUTION RANGE



Geographic locations where species has been reported to occur

NUTRITIONAL HIGHLIGHTS



- Protein
- Fiber
- Thiamine
- Magnesium
- Zinc
- Copper
- Phosphorus

ETHNOBOTANICAL INFORMATION

The grains of foxtail millet are eaten throughout Asia, southern Europe, and northern Africa. The grains can be eaten whole after boiling, or ground into flour and used for baking or making porridge. The young sprouts are eaten as a vegetable and used for brewing beer and other alcoholic beverages ^[1].

Occurring in farming systems in	Nepal
Level of domestication	domesticated
Considered a NUS	yes
Edible parts	seeds
Contribution to food group(s)	legumes, nuts and seeds
Popular ways of preparation or preservation	fried or stir-fried
Growth place	agricultural field, forest
Commercialization	no

NUTRITIONAL INFORMATION

Nutrition item	Foxtail millet, raw
Protein (grams)	14.3 ●
Fiber (grams)	8.1 ●
Thiamine (mg)	1.05 ●
Riboflavin (mg)	0.17
Niacin (mg NE)	0.59
Calcium (mg)	21
Magnesium (mg)	148 ●
Zinc (mg)	3.5 ●
Iron (mg)	3.07
Copper (ug)	1.3 ●
Sodium (g)	3.95
Potassium (mg)	410
Phosphorus (mg)	397 ●
Reference	[2]

Nutrition information is indicated per 100g of food plant item. Nutrients for which no information was found: Energy (kcal), Vitamin B6 (mg), Pantothenate (ug), Biotine (ug), Folate (ug DFE), Vitamin C (mg), Vitamin A (ug RAE or RE), Vitamin D (ug), Vitamin E (mg), Vitamin K (ug), Iodine (ug), Selenium (ug), Manganese (ug)



SINAPIS ALBA L.

BOTANICAL INFORMATION

English name
white mustard ^[1]

Scientific name
Sinapis alba L.

Local names
mostaza · Guatemala

An annual herb of 30-60 cm tall. The stem has stiff hairs and branches usually only in the higher part of the plant. The leaves are up to 15 cm long and have 1-3 pairs of deep lobes. The leaves in the middle of the plant are larger than those at the top and bottom of the plant. The flowers are yellow, 1 cm in diameter, and have four petals arranged in a cross shape. The flowers grow at the end of a stalk with several together at the top of the plant and from the base of the leaves. The fruits are 2-4.5 cm long and 3-7 mm wide, have several bumps, and contain 4-6 round pale yellow seeds of 2 mm in diameter ^[1].

Growth form terrestrial herb
Life cycle annual
Centre of origin Eastern Mediterranean and Middle East ^[1]

DISTRIBUTION RANGE



Geographic locations where species has been reported to occur

ETHNOBOTANICAL INFORMATION

The seeds from white mustard are used for their sharp taste around the world. In some parts of the world, the seeds are crushed and mixed with vinegar to make table mustard, which is used as a condiment. The leaves and young sprouts of white mustard are also edible and are eaten raw or cooked ^[1].

Occurring in farming systems in	Guatemala
Level of domestication	wild
Considered a NUS	yes
Edible parts	leaves
Contribution to food group(s)	vegetables
Popular ways of preparation or preservation	boiled
Growth place	agricultural field, home garden, forest, roadside, other
Commercialization	market

No nutritional information was found for *Sinapis alba*



SOLANUM AETHIOPICUM L.

BOTANICAL INFORMATION

An annual herb or perennial shrub that grows up to 2 m tall with many branches. The leaves grow on leafstalks of up to 11 cm long and have a broad oval shape, often with many pointy lobes, and are 12–30 cm long and 7–21 cm wide. The flowers have 5–8 white or sometimes pale purple petals that grow in a star shape and bright yellow parts in the center of the flower. The flowers grow with up to 5 together from the side of the branches. The fruits come in many shapes and colors but are generally round to egg-shaped and smooth or with deep ridges, 1–6 cm long, and green, white, red, or orange. Inside the fruit are many pale brown or yellow flat oval seeds 2–5 mm in diameter ^[1].

Growth form: terrestrial herb, shrub ^[1]
 Life cycle: annual, perennial ^[1]
 Centre of origin: tropical Africa ^[1,2]
 Stress Tolerance: Does not tolerate cold or very wet conditions ^[1].

DISTRIBUTION RANGE



Geographic locations where species has been reported to occur

NUTRITIONAL HIGHLIGHTS



- Thiamine
- Riboflavin
- Vitamin C
- Iron

ETHNOBOTANICAL INFORMATION

The unripe fruits of the African eggplant are eaten raw or cooked in stews. The young shoots and leaves are also cooked and used as leafy vegetables. The roots, fruits, and leaves of bitter varieties have many medicinal applications, such as treating nausea and as a sedative ^[1].

Occurring in farming systems in	Zambia
Level of domestication	domesticated
Considered a NUS	no
Edible parts	fruits
Contribution to food group(s)	vegetables
Popular ways of preparation or preservation	boiled, fried or stir-fried
Growth place	agricultural field, home garden, roadside
Commercialization	yes

NUTRITIONAL INFORMATION

Nutrition item	African eggplant leaves, raw ^[a]	African eggplant, raw ^[b]
Energy (kcal)	51	32
Protein (grams)	4.8	1.5
Fiber (grams)	2.8	2
Thiamine (mg)	0.23 ●	0.07
Riboflavin (mg)	0.44 ●	0.06
Niacin (mg NE)	1.8	0.8
Vitamin C (mg)	67 ●	8
Calcium (mg)	52.3	28
Iron (mg)	8 ●	1.5
Phosphorus (mg)	94	47
Reference	[2]	[2]

Nutrition information is indicated per 100g of food plant item. ^[a] leaves, raw ^[b] fruit
 Nutrients for which no information was found: Vitamin B6 (mg), Pantothenate (ug), Biotine (ug), Folate (ug DFE), Vitamin A (ug RAE or RE), Vitamin D (ug), Vitamin E (mg), Vitamin K (ug), Magnesium (mg), Zinc (mg), Iodine (ug), Selenium (ug), Copper (ug), Manganese (ug), Sodium (g), Potassium (mg)



SOLANUM BETACEUM L.

BOTANICAL INFORMATION

A small perennial tree of 2-3 m tall with a short stem and thick branches. The leaves are oval to heart-shaped, 10-35 cm long and 4-20 cm wide, covered with soft hair, and grow on a leafstalk of 7-10 cm long. The flowers are 1 cm in diameter and have a yellow center and 5 petals that are pink to light blue and which grow in a star shape. The flowers grow with several together near the end of the branches at the base of the leaves. The fruits are egg-shaped, 3-10 cm long, and 3-5 cm wide, and have a smooth purple-reddish to orange-red or yellow-coloured skin and juicy blackish to yellowish flesh. The fruit contains numerous small hard flat seeds ^[1].

Growth form tree
Life cycle perennial ^[1]
Centre of origin Andes ^[1]
Stress Tolerance Needs cool temperatures ^[1]

DISTRIBUTION RANGE



Geographic locations where species has been reported to occur

NUTRITIONAL HIGHLIGHTS



● Vitamin C

ETHNOBOTANICAL INFORMATION

The fruits of the tree tomato are eaten in multiple ways, both raw and cooked. The skin is bitter and usually not eaten raw but can be eaten when cooked. The unripe fruits are used for making chutneys and spiced sauces, whereas the ripe fruits are used in stews and salads ^[1].

Occurring in farming systems in	Guatemala	Nepal
Level of domestication	domesticated	domesticated
Considered a NUS	yes	yes
Edible parts	fruits	fruits
Contribution to food group(s)	vegetables	vegetables
Popular ways of preparation or preservation	raw	raw
Growth place	home garden, forest	-
Commercialization	no	-

NUTRITIONAL INFORMATION

Nutrition item	Tamarillo fruit, golden-yellow skin, raw ^[a]	Tamarillo fruit, purplish-red skin, raw ^[b]
Vitamin C (mg)	17 ●	16 ●
Calcium (mg)	25	22
Magnesium (mg)	16	14
Zinc (mg)	0.2	0.17
Iron (mg)	0.22	0.46
Copper (ug)	0.08	0.12
Sodium (g)	0	0.2
Potassium (mg)	398	379
Reference	[2]	[2]

Nutrition information is indicated per 100g of food plant item.

^[a] Tamarillo fruit, golden-yellow skin, yellowish-orange firm flesh, raw

^[b] Tamarillo fruit, purplish-red skin, yellowish-orange firm flesh, raw

Nutrients for which no information was found: Energy (kcal), Protein (grams), Fiber (grams), Thiamine (mg), Riboflavin (mg), Niacin (mg NE), Vitamin B6 (mg), Pantothenate (ug), Biotine (ug), Folate (ug DFE), Vitamin A (ug RAE or RE), Vitamin D (ug), Vitamin E (mg), Vitamin K (ug), Iodine (ug), Selenium (ug), Manganese (ug), Phosphorus (mg)



SOLANUM NIGRESCENS L.

BOTANICAL INFORMATION

A perennial herb or shrub of 1.5 to 3.5 m tall with soft hair on the young plant parts. The greyish-green leaves are oval with a pointy tip, 10-18 cm long and 7-10.5 cm wide, and grow on leafstalks of up to 4 cm long. The leaves grow in pairs opposite from each other, with one leaf being bigger than the other. The flowers are 8-10 mm in diameter and have five white petals, sometimes with some purple color at their base, that grow in a star shape around the yellow pointy center of the flower. The flowers grow with up to 4 together from the side of the branches. The fleshy fruits are round, with purple flesh and a green skin that turns black when ripening. The fruits contain many small flat brown seeds of 1 to 1.5 mm in diameter ^[1].

Growth form terrestrial herb, shrub ^[1]
Life cycle perennial ^[1]
Centre of origin Mesoamerica
Stress Tolerance Tolerant to heat and drought ^[1].

DISTRIBUTION RANGE



Geographic locations where species has been reported to occur

NUTRITIONAL HIGHLIGHTS



- Protein
- Fiber
- Thiamine
- Riboflavin
- Vitamin C
- Calcium
- Iron

ETHNOBOTANICAL INFORMATION

The stems and leaves of the divine nightshade are edible and often cooked in soups and sauces. The leaves are also used medicinally to treat respiratory, digestive and skin problems ^[1].

Occurring in farming systems in	Guatemala
Level of domestication	domesticated
Considered a NUS	yes
Edible parts	leaves
Contribution to food group(s)	vegetables
Popular ways of preparation or preservation	boiled
Growth place	agricultural field, home garden, forest, roadside, other
Commercialization	yes

NUTRITIONAL INFORMATION

Nutrition item	Nightshade, raw ^[a]
Energy (kcal)	45
Protein (grams)	5.1 ●
Fiber (grams)	4.34 ●
Thiamine (mg)	0.2 ●
Riboflavin (mg)	0.35 ●
Niacin (mg NE)	0.97
Vitamin C (mg)	92 ●
Vitamin A (ug RAE or RE)	34
Calcium (mg)	226 ●
Iron (mg)	12.6 ●
Phosphorus (mg)	74
Reference	^[2]

Nutrition information is indicated per 100g of food plant item.

^[a] Hierbamora/macuy/quilete, raw

Nutrients for which no information was found: Vitamin B6 (mg), Pantothenate (ug), Biotine (ug), Folate (ug DFE), Vitamin D (ug), Vitamin E (mg), Vitamin K (ug), Magnesium (mg), Zinc (mg), Iodine (ug), Selenium (ug), Copper (ug), Manganese (ug), Sodium (g), Potassium (mg)



SOLANUM NIGRUM L.

BOTANICAL INFORMATION

An annual herb that grows up to 70 cm tall, often with hairs on the stem and leaves. The leaves are more or less oval with a pointy tip, 2.5-10 cm long and 2-7 cm wide, and grow on a leafstalk of 0.5-6.5 cm long. The flowers are 0.5-1 cm in diameter, with 5 white petals that often have some yellow-green color at their base and that grow in a star shape around the yellow pointy center of the flower. The flowers grow with 3-12 together on the side of the branches. The fruit is fleshy and round, with a green skin that turns purple-black when ripe. The fruits contain many small flat creamy seeds of 2 mm in diameter ^[1].

Growth form terrestrial herb ^[1]
 Life cycle annual
 Centre of origin unresolved, major presence in Europe ^[1,2]

DISTRIBUTION RANGE



Geographic locations where species has been reported to occur

NUTRITIONAL HIGHLIGHTS



- Protein
- Fiber
- Vitamin C
- Magnesium
- Iron
- Copper

ETHNOBOTANICAL INFORMATION

The leaves and young shoots of the black nightshade are boiled and then eaten, but if they are eaten more than a few times a week this can cause stomach ache. During the boiling of the leaves and young shoots, it is recommended to refresh the cooking water a few times to get rid of potentially toxic substances. It is important to note that this species looks very similar to other species that are poisonous. The unripe berries of the black nightshade are probably toxic as possibly also the ripe fruits ^[1].

Occurring in farming systems in	Uganda
Level of domestication	domesticated
Considered a NUS	yes
Edible parts	leaves
Contribution to food group(s)	vegetables
Popular ways of preparation or preservation	boiled, steamed, dried or dehydrated
Growth place	home garden, roadside
Commercialization	yes

NUTRITIONAL INFORMATION

Nutrition item	Nightshade leaves, fresh ^[a]	Nightshade leaves, dried, powdered ^[b]
Energy (kcal)	50.08	316.63
Protein (grams)	4.38	33.39 ●
Fiber (grams)	0.56	6.22 ●
Vitamin C (mg)		88 ●
Calcium (mg)		22.2
Magnesium (mg)		239 ●
Zinc (mg)		0.11
Iron (mg)		14.2 ●
Copper (ug)		0.16 ●
Sodium (g)		0
Potassium (mg)		43
Phosphorus (mg)		80.3
Reference	^[2]	^[2]

Nutrition information is indicated per 100g of food plant item.

^[a] Leaves, fresh ^[b] Leaves, dried, powdered

Nutrients for which no information was found: Thiamine (mg), Riboflavin (mg), Niacin (mg NE), Vitamin B6 (mg), Pantothenate (ug), Biotine (ug), Folate (ug DFE), Vitamin A (ug RAE or RE), Vitamin D (ug), Vitamin E (mg), Vitamin K (ug), Iodine (ug), Selenium (ug), Manganese (ug)



SONCHUS OLERACEUS L.

BOTANICAL INFORMATION

An annual or biennial herb that can grow up to 140 cm high. The leaves fold around the branches at their base and are 8-35 cm long and 4-17 cm wide. The edges of the leaves are often toothed or softly spiny and the leaves are sometimes deeply pointy-lobed. The flowers are yellow and round and grow with several together at the top of the plant. Each flower develops into multiple seeds, which are 2.5-3.8 mm long and 0.8-1 mm wide and which have 4 clear edges. The seeds are attached to soft tufts of white hair which help the seeds to be dispersed by the wind ^[1].

Growth form: terrestrial herb
 Life cycle: annual, biennial ^[1]
 Centre of origin: northern Africa, West Asia, and Europe ^[2]

DISTRIBUTION RANGE



Geographic locations where species has been reported to occur

NUTRITIONAL HIGHLIGHTS



● Copper

ETHNOBOTANICAL INFORMATION

The leaves of the common sow thistle are edible and eaten raw or boiled. They are also fed to animals and used as a medicine to increase appetite ^[1].

Occurring in farming systems in	Guatemala
Level of domestication	domesticated
Considered a NUS	yes
Edible parts	leaves
Contribution to food group(s)	vegetables
Popular ways of preparation or preservation	boiled
Growth place	agricultural field, home garden, forest, roadside
Commercialization	yes

NUTRITIONAL INFORMATION

Nutrition item	Sow thistle leaves, raw ^[a]	Serralha, leaf, raw ^[b]
Protein (grams)	2.2	
Fiber (grams)	1.5	
Thiamine (mg)	0.03	
Riboflavin (mg)	0.11	
Vitamin C (mg)	25	
Vitamin A (ug RAE or RE)		600
Calcium (mg)	193	
Magnesium (mg)	50.7	
Zinc (mg)	0.9	
Iron (mg)	7.1	
Copper (ug)	0.25 ●	
Sodium (g)	0	
Potassium (mg)	371	
Phosphorus (mg)	40.6	
Reference	^[3]	^[3]

Nutrition information is indicated per 100g of food plant item.

^[a] Sowthistle/ Sow thistle/ Smooth sow thistle/ Annual sow thistle/ Hare's Cotwort/ Hare's thistle/ Milky tassel/ Swinies, leaf, raw ^[b] Serralha, leaf, raw

Nutrients for which no information was found: Energy (kcal), Niacin (mg NE), Vitamin B6 (mg), Pantothenate (ug), Biotine (ug), Folate (ug DFE), Vitamin D (ug), Vitamin E (mg), Vitamin K (ug), Iodine (ug), Selenium (ug), Manganese (ug)



STRYCHNOS MADAGASCARIENSIS L.

BOTANICAL INFORMATION

A perennial shrub or smaller tree growing up to 10 m high with many branches. The stem can be up to 60 cm in diameter and the bark is pale grey and smooth. The leaves are hairy on both sides, shiny and dark brown on the upper side, and paler on the underside, 2-10 cm long and 1-4 cm wide, and have 3 pale large veins. The flowers are greenish-yellow and shaped like a trumpet with four petals in a cross shape at the end. The flowers grow with several together at the base of the leaves and often appear after heavy rain. The fruit is round and often shiny, 2-8 cm in diameter, and has a hard shell that turns from green to yellow when ripening. The flesh of the fruit is orange and slimy and contains 5-50 seeds 1-2.5 cm long and 0.5-1 cm wide ^[1].

Growth form shrub, tree ^[1]
Life cycle perennial
Centre of origin Southern Africa

DISTRIBUTION RANGE



Geographic locations where species has been reported to occur

NUTRITIONAL HIGHLIGHTS



- Fiber
- Copper

ETHNOBOTANICAL INFORMATION

The pulp inside the fruits can be eaten fresh or dried and pounded into flour. The seeds are also edible, but should not be eaten in too large amounts as they contain a small amount of toxins ^[1, 2].

Occurring in farming systems in	Zimbabwe
Level of domestication	semi-domesticated
Considered a NUS	yes
Edible parts	fruits
Contribution to food group(s)	fruits
Popular ways of preparation or preservation	raw, dried
Growth place	forest
Commercialization	no

NUTRITIONAL INFORMATION

Nutrition item	Black monkey orange, raw
Protein (grams)	1
Fiber (grams)	5.4 ●
Thiamine (mg)	0.06
Riboflavin (mg)	0.05
Vitamin C (mg)	12.2
Calcium (mg)	16.5
Magnesium (mg)	28.6
Zinc (mg)	0.48
Iron (mg)	1.53
Copper (ug)	0.37 ●
Sodium (g)	0
Potassium (mg)	400
Phosphorus (mg)	33.7
Reference	^[3]

Nutrition information is indicated per 100g of food plant item.

Nutrients for which no information was found: Niacin (mg NE), Vitamin B6 (mg), Pantothenate (ug), Biotine (ug), Folate (ug DFE), Vitamin A (ug RAE or RE), Vitamin D (ug), Vitamin E (mg), Vitamin K (ug), Iodine (ug), Selenium (ug), Manganese (ug)



STRYCHNOS SPINOSA L.

BOTANICAL INFORMATION

A perennial shrub or tree that grows up to 6 m high, with a stem of 4-15 cm in diameter and spiny branches. The bark is grey or brown and often scaly. The leaves are leathery with a round to stretched oval shape, 1.5-9.5 cm long and 1-7.5 cm wide and have 3 pale large veins. The flowers are pale green or sometimes creamy yellow-white, shaped a bit like a tube with 5 petals at the end, and grow at the end of the branches. The fruit is round and often shiny, 7-11 cm in diameter, and has a hard shell that turns from green to yellow when ripening. The flesh of the fruit is yellow and contains 10-100 flat round seeds of 1.5-2 cm in diameter ^[1].

Growth form shrub, tree ^[1]
Life cycle perennial ^[1]
Centre of origin Sub-Saharan Africa ^[1]

DISTRIBUTION RANGE



Geographic locations where species has been reported to occur

NUTRITIONAL HIGHLIGHTS



- Thiamine
- Copper

ETHNOBOTANICAL INFORMATION

The pulp inside the ripe fruits is eaten fresh or dried and can be used in the preparation of alcoholic drinks. The hard outside shell of the fruits is furthermore used for making musical instruments and the wood of the tree is used for carpentry ^[1].

Occurring in farming systems in	Zimbabwe
Level of domestication	wild
Considered a NUS	yes
Edible parts	fruits
Contribution to food group(s)	fruits
Popular ways of preparation or preservation	raw, dried or dehydrated
Growth place	agricultural field, forest, roadside
Commercialization	no

NUTRITIONAL INFORMATION

Nutrition item	Monkey orange, raw ^[a]
Protein (grams)	2.7
Fiber (grams)	1.4
Thiamine (mg)	0.23 ●
Riboflavin (mg)	0.1
Vitamin C (mg)	10.5
Calcium (mg)	45.8
Magnesium (mg)	43.6
Zinc (mg)	0.12
Iron (mg)	0.75
Copper (ug)	0.46 ●
Sodium (g)	0
Potassium (mg)	328
Phosphorus (mg)	22.6
Reference	^[2]

Nutrition information is indicated per 100g of food plant item.

^[a] Spiny Monkey-orange/ Green Monkey Orange, fruit flesh, raw

Nutrients for which no information was found: Energy (kcal), Niacin (mg NE), Vitamin B6 (mg), Pantothenate (ug), Biotin (ug), Folate (ug DFE), Vitamin A (ug RAE or RE), Vitamin D (ug), Vitamin E (mg), Vitamin K (ug), Iodine (ug), Selenium (ug), Manganese (ug)



SYZYGIUM CORDATUM L.

BOTANICAL INFORMATION

A perennial tree growing up to 20 m tall, with a gnarly and much-branched stem that is up to 60 cm in diameter. The bark is rough and cracked or flaking. The leaves are leathery, blue-green on the upper side of the leaves and pale green below, and have a round to oval shape, 2.5-13.5 cm long and 2-8 cm wide. The leaves grow in pairs on opposite sides of the branches with most leaves growing at the tip of the branches. The flowers look like many creamy white and fluffy hairs of 1-1.5 cm long that grow together at the end of the branches. The fruits are purple when ripe, round to oval in shape, 1-2 cm long and 0.5-1 cm wide, and have a single seed ^[1].

Growth form tree
Life cycle perennial
Centre of origin Southern Africa ^[1]

DISTRIBUTION RANGE



Geographic locations where species has been reported to occur

NUTRITIONAL HIGHLIGHTS



- Riboflavin
- Copper

ETHNOBOTANICAL INFORMATION

The fruit of the water berry can be eaten raw, or made into jellies and alcoholic drinks. The fruits are also used to make a purple dye, whereas an orange dye can be made from the bark. The bark is furthermore used as fish poison, by grinding it and putting it in water. The wood of the tree does not quickly rot away in wet conditions and is therefore used for making boats and constructions in water. The wood is furthermore valued as firewood and to make charcoal ^[1].

Occurring in farming systems in	Zimbabwe
Level of domestication	wild
Considered a NUS	yes
Edible parts	fruits
Contribution to food group(s)	fruits
Popular ways of preparation or preservation	raw, dried
Growth place	forest
Commercialization	no

NUTRITIONAL INFORMATION

Nutrition item	Water berry, raw
Protein (grams)	0.6
Fiber (grams)	1.5
Thiamine (mg)	0.03
Riboflavin (mg)	0.31 ●
Vitamin C (mg)	11.6
Calcium (mg)	31.9
Magnesium (mg)	29.8
Zinc (mg)	0.2
Iron (mg)	1.43
Copper (ug)	0.18 ●
Sodium (g)	0
Potassium (mg)	222
Phosphorus (mg)	14.2
Reference	^[2]

Nutrition information is indicated per 100g of food plant item.

Nutrients for which no information was found: Energy (kcal), Niacin (mg NE), Vitamin B6 (mg), Pantothenate (ug), Biotin (ug), Folate (ug DFE), Vitamin A (ug RAE or RE), Vitamin D (ug), Vitamin E (mg), Vitamin K (ug), Iodine (ug), Selenium (ug), Manganese (ug)



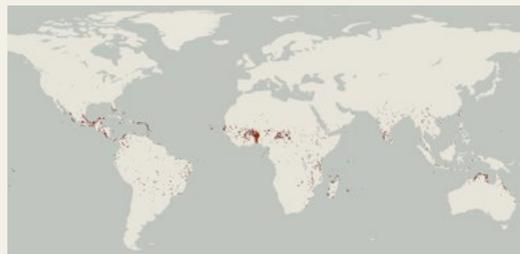
TAMARINDUS INDICA L.

BOTANICAL INFORMATION

A perennial tree growing up to 30 m high with a stem up to 2 m in diameter and a greyish-brown, rough, and cracked bark. The leaves are up to 13 cm long and 5 cm wide and are composed of 8-16 pairs of leaflets that grow opposite each other. The leaflets are oval in shape, 1-3.5 cm long and 0.5-1 cm wide. The flowers are up to 3 cm in diameter, with 4 creamy yellow sepals and 3 petals at one side of the flower that are cream yellow-white with brown-red veins. The fruit is a flattened pod with wavy edges, up to 14 cm long and 4 cm wide, and has brown skin. The inside of the fruit contains a blackish-brown thick-syrupy flesh and up to 10 seeds. The seeds are very hard, brown, flat kidney-shaped, and up to 18 mm long ^[1].

Growth form tree
 Life cycle perennial
 Centre of origin tropical Africa

DISTRIBUTION RANGE



Geographic locations where species has been reported to occur

NUTRITIONAL HIGHLIGHTS

- Fiber
- Thiamine
- Calcium
- Magnesium
- Magnesium
- Fiber
- Phosphorus



ETHNOBOTANICAL INFORMATION

The fruits, flowers, leaves, and seeds of tamarind are all edible. The fruit pulp is sour and sweet and used in soups, stews, and sauces. The pulp is also used to flavor drinks and to make sweets. The seeds are soaked in water, boiled, and then the seed coat is removed before they can be eaten. The inside of the seeds are often roasted or ground into flour to make bread. Various parts of the tamarind plant have medicinal uses, including improving digestion and treating skin problems ^[1].

Occurring in farming systems in	Uganda
Level of domestication	wild
Considered a NUS	yes
Edible parts	fruits, seeds
Contribution to food group(s)	legumes, nuts and seeds
Growth place	other
Commercialization	no

NUTRITIONAL INFORMATION

Nutrition item	Tamarind fruit, raw ^[a]	Tamarind fruit, dried ^[b]
Energy (kcal)	286	270
Protein (grams)	4.2	5
Fiber (grams)	18.3 ●	18.3 ●
Thiamine (mg)	0.26 ●	0.18
Riboflavin (mg)	0.14	0.09
Niacin (mg NE)	1	0.6
Vitamin B6 (mg)	0.07	
Folate (ug DFE)	15	
Vitamin C (mg)	4	9
Vitamin A (ug RAE or RE)	1	
Vitamin D (ug)	0	
Vitamin E (mg)	0.09	
Calcium (mg)	151 ●	166
Magnesium (mg)	68 ●	
Zinc (mg)	0.11	
Iron (mg)	2.2	2.2
Copper (ug)	0.09	
Sodium (g)	0	
Potassium (mg)	648 ●	
Phosphorus (mg)	103	190 ●
Reference	^[2]	^[2]

Nutrition information is indicated per 100g of food plant item.

^[a] Tamarind, fruit, raw [Bwemba] ^[b] Tamarind, fruit, dried

Nutrients for which no information was found: Pantothenate (ug), Biotine (ug), Vitamin K (ug), Iodine (ug), Selenium (ug), Manganese (ug)

TARAXACUM OFFICINALE L.

BOTANICAL INFORMATION

A perennial herb that grows up to 30 cm tall. All parts of the plant contain a white milky latex. The leaves are 4–35 cm long and 0.7–10 cm wide and are deeply and sharply lobed, with the tip of the leaf having the shape of an arrow point. The leaves grow in a circular pattern on the ground at the base of the plant. The flowers are a yellow round circle of 3.5–5 cm in diameter. Each flower grows alone at the top of a hollow thin stem up to 30 cm above the ground, which grows from the base of the plant. The seeds are greenish to brown, 3 mm long, and are attached to 6–12 mm long white tufts of hair which have the shape of an umbrella, allowing the seeds to be dispersed by the wind ^[1].

Growth form terrestrial herb
Life cycle perennial ^[1]
Centre of origin Europe and temperate Asia ^[1]

DISTRIBUTION RANGE



Geographic locations where species has been reported to occur

NUTRITIONAL HIGHLIGHTS



- Protein
- Fiber
- Vitamin C
- Calcium
- Magnesium
- Potassium
- Phosphorus

ETHNOBOTANICAL INFORMATION

The whole dandelion plant is edible. The bitter leaves and unopened flower buds are eaten raw, cooked, or pickled and the ground roots can be used as a coffee substitute. The plant has numerous medical applications, including to improve digestion and to treat skin and liver problems ^[1].

Occurring in farming systems in	Peru
Level of domestication	wild
Considered a NUS	yes
Edible parts	shoots
Contribution to food group(s)	vegetables
Popular ways of preparation or preservation	raw, boiled, steamed, blanched
Growth place	agricultural field, home garden, roadside
Commercialization	yes

NUTRITIONAL INFORMATION

Nutrition item	Dandelion leaves, dried, flour
Protein (grams)	15.48 ●
Fiber (grams)	47.8 ●
Vitamin C (mg)	53 ●
Calcium (mg)	695 ●
Magnesium (mg)	470 ●
Potassium (mg)	2520 ●
Phosphorus (mg)	700 ●
Reference	[2]

Nutrition information is indicated per 100g of food plant item.

Nutrients for which no information was found: Energy (kcal), Thiamine (mg), Riboflavin (mg), Niacin (mg NE), Vitamin B6 (mg), Pantothenate (ug), Biotine (ug), Folate (ug DFE), Vitamin A (ug RAE or RE), Vitamin D (ug), Vitamin E (mg), Vitamin K (ug), Zinc (mg), Iron (mg), Iodine (ug), Selenium (ug), Copper (ug), Manganese (ug), Sodium (g)



THESPESIA GARCKEANA L.

BOTANICAL INFORMATION

A small tree growing up to 12 meters high with a lot of branches. The leaves are more or less round in shape and 3-20 cm in diameter, with 3-5 rounded lobes, growing on leaf stalks of 1.5-13 cm long. The flowers grow solitary from the base of the leaves, on flower stalks 2-7 cm long. Flowers are yellow to sometimes purple in color, dark red or purple at the base, and 10-13 cm in diameter. The fruits are green to brown-red, more or less round, and 3-4 cm in diameter ^[1].

Growth form tree
Life cycle perennial
Centre of origin Sub-Saharan African

DISTRIBUTION RANGE



Geographic locations where species has been reported to occur

NUTRITIONAL HIGHLIGHTS



- Protein
- Fiber
- Magnesium
- Iron
- Potassium

ETHNOBOTANICAL INFORMATION

The inside of the green unripe fruits can be eaten raw, which tastes sweet and has a slimy texture. The fruit peel and seeds are not eaten. The ripe fruit is cooked into a porridge and is also edible raw but is then a bit more fibrous. The leaves are good as livestock fodder and fiber can be made from the inner bark of the tree to make ropes. The wood is furthermore a valuable firewood and is used to make tools. A decoction of the roots can be taken orally to treat painful menstruation, coughs, and chest pains ^[1].

Occurring in farming systems in	Guatemala	Zimbabwe
Level of domestication	wild	wild
Considered a NUS	yes	yes
Edible parts	fruits	fruits
Contribution to food group(s)	fruits	fruits
Popular ways of preparation or preservation	raw	raw, boiled
Growth place	forest	forest
Commercialization	yes	no

NUTRITIONAL INFORMATION

Nutrition item	Jakjak fruit, raw ^[a]
Energy (kcal)	201
Protein (grams)	6.3 ●
Fiber (grams)	23.9 ●
Vitamin D (ug)	0
Calcium (mg)	5
Magnesium (mg)	77 ●
Iron (mg)	4.4 ●
Sodium (g)	0
Potassium (mg)	1383 ●
Phosphorus (mg)	78
Reference	[2]

Nutrition information is indicated per 100g of food plant item. ^[a] Jakjak fruit, (Matowo)
Nutrients for which no information was found: Thiamine (mg), Riboflavin (mg), Niacin (mg NE), Vitamin B6 (mg), Pantothenate (ug), Biotine (ug), Folate (ug DFE), Vitamin C (mg), Vitamin A (ug RAE or RE), Vitamin E (mg), Vitamin K (ug), Zinc (mg), Iodine (ug), Selenium (ug), Copper (ug), Manganese (ug)



TROPAEOLUM TUBEROSUM L.

BOTANICAL INFORMATION

A perennial herbaceous climber that grows up to 3 m long. The plant has creamy yellow-white to purple-red tubers that are oval or cone-shaped and 5-15 cm long and 3-6 cm in diameter. The leaves are more or less round, 5-20 cm in diameter, and have 3-7 rounded lobes. The flowers grow on long twining leafstalks that are attached to the middle of the underside of the leaves. The flowers are orange to red, trumpet-shaped, and have 5 yellow-orange petals at the mouth. The flowers grow on flower stalks 10-19 cm long which sprout from the base of the leafstalks ^[1].

Growth form terrestrial herb, climber ^[1]
Life cycle perennial
Centre of origin Andes

DISTRIBUTION RANGE



Geographic locations where species has been reported to occur

NUTRITIONAL HIGHLIGHTS



• Vitamin C

ETHNOBOTANICAL INFORMATION

One of a series of tuber species indigenous to and still popular in the Andes. The tubers of mashua are eaten boiled. The flowers can be eaten raw and are often eaten in salads. The tubers are also used medicinally to treat kidney, liver, and skin diseases ^[1].

Occurring in farming systems in	Peru
Level of domestication	domesticated
Considered a NUS	yes
Edible parts	roots/tubers
Contribution to food group(s)	tubers and roots
Popular ways of preparation or preservation	boiled, fried or stir-fried, steamed, dried or dehydrated, frozen
Growth place	agricultural field
Commercialization	no

NUTRITIONAL INFORMATION

Nutrition item	Mashua, raw
Energy (kcal)	32
Protein (grams)	0.7
Fiber (grams)	2.9
Thiamine (mg)	0.02
Riboflavin (mg)	0.03
Niacin (mg NE)	0.82
Vitamin C (mg)	42.06 ●
Zinc (mg)	0.28
Iron (mg)	0.37
Reference	^[2]

Nutrition information is indicated per 100g of food plant item.

Nutrients for which no information was found: Vitamin B6 (mg), Pantothenate (ug), Biotine (ug), Folate (ug DFE), Vitamin A (ug RAE or RE), Vitamin D (ug), Vitamin E (mg), Vitamin K (ug), Calcium (mg), Magnesium (mg), Iodine (ug), Selenium (ug), Copper (ug), Manganese (ug), Sodium (g), Potassium (mg), Phosphorus (mg)



UAPACA KIRKIANA L.

BOTANICAL INFORMATION

A perennial tree that grows up to 12 m high with a stem that grows up to 30 cm in diameter. The bark is dark grey or blackish and cracked with vertical lines. The leaves are dark green above and paler green below, with a pale yellow-green vein in the middle of the leaf and 12-24 smaller veins that run almost perpendicular to the main vein. The leaves are 10-27 cm long and 7-17 cm wide and grow on leafstalks 0.5-2 cm long. Most leaves grow at the end of the branches. The flowers grow directly on the branches 15-30 cm below the leaves. The flowers are made up of a central stalk, on which several pale yellow or whitish petals grow 5-7 mm long and 3-5 mm wide, with at the end of the central stalk a round sphere of 7-8 mm in diameter. The fruits are round berries of 4 cm in diameter, reddish brown to green when young, and turning into orange-yellow when ripening ^[1].

Growth form tree
Life cycle perennial
Centre of origin Sub-Saharan Africa

DISTRIBUTION RANGE



Geographic locations where species has been reported to occur

NUTRITIONAL HIGHLIGHTS



● Manganese

ETHNOBOTANICAL INFORMATION

The fruits of the wild loquat are eaten raw or processed into jams, sweets, and alcoholic drinks. The ash from the wood is used as a condiment for flavoring foods. The wood is furthermore used for carpentry and construction purposes, as firewood and to make charcoal. The roots are used to make a blue dye and used medicinally to treat digestive problems ^[1].

Occurring in farming systems in	Zimbabwe
Level of domestication	semidomesticated
Considered a NUS	no
Edible parts	fruits
Contribution to food group(s)	fruits
Popular ways of preparation or preservation	raw
Growth place	agricultural field, home garden, forest, roadside
Commercialization	yes

NUTRITIONAL INFORMATION

Nutrition item	Wild loquat, raw ^[A]
Energy (kcal)	52
Protein (grams)	0.4
Fiber (grams)	1.7
Thiamine (mg)	0.02
Riboflavin (mg)	0.02
Niacin (mg NE)	0.2
Vitamin B6 (mg)	0.1
Folate (ug DFE)	14
Vitamin C (mg)	1
Vitamin A (ug RAE or RE)	76
Vitamin D (ug)	0
Calcium (mg)	16
Magnesium (mg)	13
Zinc (mg)	0.05
Iron (mg)	0.3
Selenium (ug)	0.6
Copper (ug)	0.04
Manganese (ug)	148 ●
Sodium (g)	0
Potassium (mg)	266
Phosphorus (mg)	27
Reference	[2]

Nutrition information is indicated per 100g of food plant item. ^[A] Loquats, wild, *Uapaca kirkiana*, Masuku a mtchire
Nutrients for which no information was found: Pantothenate (ug), Biotine (ug), Vitamin E (mg), Vitamin K (ug), Iodine (ug)



ULLUCUS TUBEROSUS L.

BOTANICAL INFORMATION

A perennial herb with twining and sometimes crawling red-greenish fleshy stems up to 30 cm long. The plant forms several tubers underground that are round, 4-6 cm in diameter, and with smooth skin that is colored white, orange, yellow, red, green, or a mix of these colors. The inside of the tubers is yellow, crispy, and a little slimy. The leaves are fleshy, heart to kidney-shaped, 5-20 cm long and 5-12 cm wide. The flowers are small and star-shaped, with 5 green-yellow petals, and grow with a few together from the leaf base ^[1].

Growth form terrestrial herb
Life cycle perennial
Centre of origin Andes

DISTRIBUTION RANGE



Geographic locations where species has been reported to occur

NUTRITIONAL HIGHLIGHTS



• Fiber

ETHNOBOTANICAL INFORMATION

The ulluco tubers are an important food in the Andes, in particular amongst the indigenous peoples, where they are boiled and eaten in stews or soups, or dried and then ground into flour for later use. The leaves are also edible ^[1].

Occurring in farming systems in	Peru
Level of domestication	domesticated
Considered a NUS	yes
Edible parts	roots/tubers, leaves
Contribution to food group(s)	tubers and roots; vegetables
Popular ways of preparation or preservation	boiled, fried or stir-fried, steamed
Growth place	agricultural field, home garden, other
Commercialization	no

NUTRITIONAL INFORMATION

Nutrition item	Ulluco tuber, raw	Ulluco tuber, boiled
Energy (kcal)		59
Protein (grams)	1.7	
Fiber (grams)	6.56 ●	
Calcium (mg)		2
Magnesium (mg)		8
Zinc (mg)		0.24
Iron (mg)		0.25
Copper (ug)		0.06
Sodium (g)		0
Potassium (mg)		174
Phosphorus (mg)		20
Reference	[2]	[3]

Nutrition information is indicated per 100g of food plant item.

Nutrients for which no information was found: Thiamine (mg), Riboflavin (mg), Niacin (mg NE), Vitamin B6 (mg), Pantothenate (ug), Biotine (ug), Folate (ug DFE), Vitamin C (mg), Vitamin A (ug RAE or RE), Vitamin D (ug), Vitamin E (mg), Vitamin K (ug), Iodine (ug), Selenium (ug), Manganese (ug)



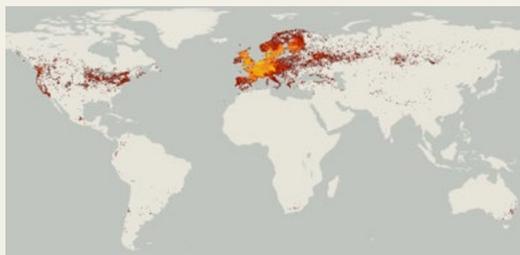
URTICA DIOICA L.

BOTANICAL INFORMATION

An annual or more often perennial herb that can grow up to 1 m tall with little to no branches and stinging hairs on the leaves and stem. The stem is square-shaped in cross-section. The leaves are egg-shaped with a pointy tip, 5-13 cm long and 2.5-6 cm wide, and grow on a leaf-stalk of 2.5-4 cm long. The leaves grow in pairs on opposite sides of the stem, with each next set of leaves being placed perpendicular to the previous one. The small flowers are green, up to 1.5 mm in diameter, and grow with many together on hanging stalks at the base of the leaves ^[1].

Growth form terrestrial herb
Life cycle annual, perennial ^[1]
Centre of origin Europe, North Africa, temperate Asia

DISTRIBUTION RANGE



Geographic locations where species has been reported to occur

NUTRITIONAL HIGHLIGHTS



- Protein
- Calcium
- Iron

ETHNOBOTANICAL INFORMATION

The stinging nettle is a very versatile plant that has been used for many centuries throughout Asia, northern Africa, and Europe. The leaves, young shoots, and seeds are added to soups and sauces and are very nutritious. The plant is also used for the production of fibers, from which rope, textile, and paper are made. The plant has many medicinal applications, such as improving digestion, the skin, blood, and muscles ^[1].

Occurring in farming systems in	Nepal
Level of domestication	wild
Considered a NUS	yes
Edible parts	leaves
Contribution to food group(s)	vegetables
Popular ways of preparation or preservation	steamed
Growth place	forest, other
Commercialization	no

NUTRITIONAL INFORMATION

Nutrition item	Stinging nettle leaves, raw ^[A]
Energy (kcal)	53
Protein (grams)	6.9 ●
Fiber (grams)	1.8
Vitamin C (mg)	5.5
Vitamin A (ug RAE or RE)	34
Calcium (mg)	981.3 ●
Iron (mg)	99 ●
Reference	[2]

Nutrition information is indicated per 100g of food plant item. ^[A] Stinging nettle, sisnu, leaves
Nutrients for which no information was found: Thiamine (mg), Riboflavin (mg), Niacin (mg NE), Vitamin B6 (mg), Pantothenate (ug), Biotine (ug), Folate (ug DFE), Vitamin D (ug), Vitamin E (mg), Vitamin K (ug), Magnesium (mg), Zinc (mg), Iodine (ug), Selenium (ug), Copper (ug), Manganese (ug), Sodium (g), Potassium (mg), Phosphorus (mg)



VIGNA RADIATA L.

BOTANICAL INFORMATION

An annual herb growing up to 1.3 m tall with many branches. The leaves are composed of 3 dark green leaflets which are oval with a pointy tip, 5-18 cm long and 3-15 cm wide, and which grow on a leafstalk of 5-21 cm long. The flowers are yellow, 11 mm long, and 16 mm wide, and grow with 4-15 together from the base of the leaves. The flowers do not bloom at the same time, such that often some flowers and fruits grow next to each other. The fruits are black or brown bean pods 4-9 cm long and 4-9 mm wide and contain 10-15 seeds. The seeds are round to oval, 2.5-4 mm long, and 2.5-3 mm wide, and are often green, but can also be yellow, brown, or purplish black. The seeds have a single white line on their side of 1.5 mm long and 0.5 mm wide ^[1].

Growth form terrestrial herb ^[1]
Life cycle annual
Centre of origin India

DISTRIBUTION RANGE



Geographic locations where species has been reported to occur

NUTRITIONAL HIGHLIGHTS



● Protein

ETHNOBOTANICAL INFORMATION

Mung beans have been cultivated for millennia and are now mainly eaten in Asia and to a lesser degree in Africa, and in other continents as a result of internationalization of diets. The seeds are ground to flour or boiled whole and are mainly used in sauces or cooked together with grains. The young sprouts are eaten raw or briefly cooked. The immature bean pods and young leaves can also be eaten after cooking ^[1].

Occurring in farming systems in	Uganda
Level of domestication	domesticated
Considered a NUS	yes
Edible parts	seeds
Contribution to food group(s)	legumes, nuts and seeds
Popular ways of preparation or preservation	dried or dehydrated
Growth place	agricultural field, home garden, other
Commercialization	yes

NUTRITIONAL INFORMATION

Nutrition item	Mung bean seed, pressure-cooked
Protein (grams)	8.41 ●
Thiamine (mg)	0.09
Reference	[2]

Nutrition information is indicated per 100g of food plant item.
Nutrients for which no information was found: Energy (kcal), Fiber (grams), Riboflavin (mg), Niacin (mg NE), Vitamin B6 (mg), Pantothenate (ug), Biotine (ug), Folate (ug DFE), Vitamin C (mg), Vitamin A (ug RAE or RE), Vitamin D (ug), Vitamin E (mg), Vitamin K (ug), Calcium (mg), Magnesium (mg), Zinc (mg), Iron (mg), Iodine (ug), Selenium (ug), Copper (ug), Manganese (ug), Sodium (g), Potassium (mg), Phosphorus (mg)



VIGNA SUBTERRANEA L.

BOTANICAL INFORMATION

An annual herb with creeping stems that grows up to 40 cm tall. The plant has brown roots, with several white and round or egg-shaped balls underground, which help the plant obtain nutrients. The leaves are composed of 3 leaflets which are oval in shape, 3-10 cm long and 1-5 cm wide, and which grow on a leafstalk of up to 30 cm long. The flowers are whitish-yellow, 4-7 mm long, and grow with 1-3 together close to the ground. The fruit is a round pod of 2.5 cm in diameter with often a single seed inside. The seed is round to oval and white, red, brown, or black with a single small white dot ^[1].

Growth form terrestrial herb
 Life cycle annual
 Centre of origin West & Central Africa ^[1]

DISTRIBUTION RANGE



Geographic locations where species has been reported to occur

NUTRITIONAL HIGHLIGHTS



- Protein
- Fiber
- Niacin
- Magnesium
- Copper
- Manganese
- Potassium
- Phosphorus



- Protein
- Fiber
- Magnesium
- Copper

ETHNOBOTANICAL INFORMATION

The mature, dried seeds of Bambara groundnut are boiled and eaten in a variety of dishes. They can also be ground into flour to make porridge. The seeds are also fed to pigs and poultry, and the leafy shoots are used as animal fodder. In West Africa, the seeds are sometimes used in ceremonies such as funeral rites ^[1].

Occurring in farming systems in	Zambia	Uganda	Zimbabwe
Level of domestication	Domesticated	Domesticated	Domesticated
Considered a NUS	No	Yes	Yes
Edible parts	Seeds	Seeds	Seeds
Contribution to food group(s)	Legumes, nuts and seeds	Legumes, nuts and seeds	Legumes, nuts and seeds
Popular ways of preparation or preservation	boiled, dried (dehydrated)	boiled, steamed, dried (dehydrated)	boiled
Growth place	Agricultural field	-	Agricultural field, Roadside
Commercialization	No	No	No

NUTRITIONAL INFORMATION

Nutrition item	Bambara groundnuts, dried, raw ^[A]	Bambara groundnuts, boiled ^[B]	Bambara groundnuts, boiled [water not discarded] ^[B]
Energy (kcal)	324.59	120.66	73.43
Protein (grams)	18.44 ●	6.85 ●	4.17
Fiber (grams)	28.93 ●	10.75 ●	6.54 ●
Thiamine (mg)	0.04	0.01	0
Riboflavin (mg)	0.07	0.01	0.01
Niacin (mg NE)	4.2 ●	1.26	0.82
Calcium (mg)	39.96	12.62	9.04
Magnesium (mg)	171.53 ●	54.2 ●	38.81
Zinc (mg)	1.94	0.64	0.43
Iron (mg)	2.73	0.86	0.61
Copper (ug)	0.69 ●	0.18 ●	0.16 ●
Manganese (ug)	1 ●	0	0
Sodium (g)	0	0.66	0.48
Potassium (mg)	1330 ●	371.32	271.18
Phosphorus (mg)	223.59 ●	74.8	50.58
Reference	[2]	[2]	[2]

Nutrition information is indicated per 100g of food plant item.

^[A] Bambara groundnuts, dried, raw ^[B] Bambara groundnuts, water-soaked, boiled in different water, without salt, drained ^[C] Bambara groundnuts, water-soaked, boiled in different water, without salt [water not discarded]

Nutrients for which no information was found: Vitamin B6 (mg), Pantothenate (ug), Biotine (ug), Folate (ug DFE), Vitamin C (mg), Vitamin A (ug RAE or RE), Vitamin D (ug), Vitamin E (mg), Vitamin K (ug), Iodine (ug), Selenium (ug)



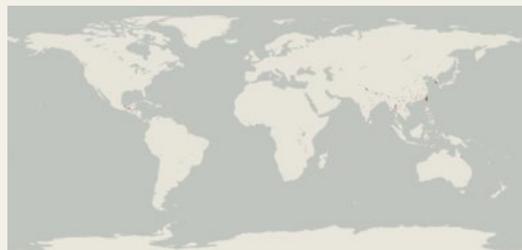
VIGNA UMBELLATA L.

BOTANICAL INFORMATION

An annual herb of 30–75 cm tall with sometimes climbing stems and fine hairs on all plant parts. The leaves are composed of a leafstalk of 5–10 cm and three leaflets, which are either oval in shape or shaped like the point of a spear, 5–10 cm long and 2.5–6 cm wide. The flowers are bright yellow and up to 2 cm in diameter and bloom with 2–3 together at the top or the sides of the plant. Next to the blooming flowers are 5–20 more flower buds which will later develop into flowers. The fruits are bean pods 6–13 cm long and 0.5 cm wide and contain 10–16 seeds. The seeds are smooth and shaped like rice grains, 5–10 mm long and 2–5 mm wide, and colored dark red, green, yellow, brown or black ^[1].

Growth form	terrestrial herb
Life cycle	annual ^[1]
Centre of origin	South & Southeast Asia ^[1]
Stress Tolerance	Tolerates high temperatures and moderate droughts. Not frost tolerant ^[1] .

DISTRIBUTION RANGE



Geographic locations where species has been reported to occur

NUTRITIONAL HIGHLIGHTS



- Protein
- Fiber
- Magnesium
- Copper
- Manganese

ETHNOBOTANICAL INFORMATION

The seeds of rice beans are boiled and eaten like rice. The young pods, leaves, and sprouts are also eaten after cooking. The whole plants can furthermore be used as animal fodder ^[1].

Occurring in farming systems in	Uganda	Nepal
Level of domestication	domesticated	domesticated
Considered a NUS	yes	yes
Edible parts	leaves, stems	seeds
Contribution to food group(s)	vegetables	legumes, nuts and seeds
Popular ways of preparation or preservation	boiled, dried	boiled
Growth place	other	-
Commercialization	yes	-

NUTRITIONAL INFORMATION

Nutrition item	Rice bean, boiled ^[A]
Energy (kcal)	115.83
Protein (grams)	6.99 ●
Fiber (grams)	5.64 ●
Thiamine (mg)	0.11
Riboflavin (mg)	0.07
Niacin (mg NE)	0.8
Vitamin B6 (mg)	0.03
Vitamin C (mg)	0.27
Calcium (mg)	90.2
Magnesium (mg)	63.46 ●
Zinc (mg)	0.94
Iron (mg)	1.89
Copper (ug)	0.31 ●
Manganese (ug)	1 ●
Sodium (g)	0
Potassium (mg)	386.91
Phosphorus (mg)	101.37
Reference	[2]

Nutrition information is indicated per 100g of food plant item.

^[A] Rice bean, mature, whole, water-soaked, boiled in different water, without salt, drained
Nutrients for which no information was found: Pantothenate (ug), Biotine (ug), Folate (ug DFE), Vitamin A (ug RAE or RE), Vitamin D (ug), Vitamin E (mg), Vitamin K (ug), Iodine (ug), Selenium (ug)



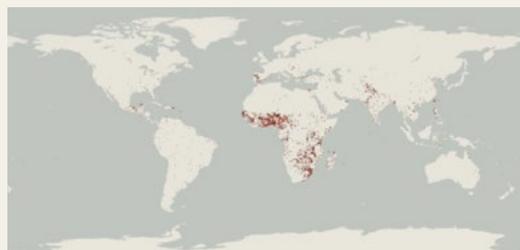
VIGNA UNGUICULATA L.

BOTANICAL INFORMATION

An annual or perennial herb with a stem of up to 4 m long, that sometimes creeps or climbs. The plant is normally grown as an annual. The leaves are composed of a leafstalk of up to 15 cm long and three leaflets, which are oval to rectangular, 7-14 cm long and 4-10 cm wide. The flowers are purple, blue, or purple-pink with some yellow in the middle, and 2.5 cm long. The flowers grow with several together at the top of the plant or from the base of the leafstalks. The fruits are bean pods 8-30 cm long which turn from green to pale brown when ripening. The fruits contain 8-30 seeds which are round to oval, 0.5-1 cm long, and black, brown, pink, or white ^[1].

Growth form creeper, climber, terrestrial herb ^[1]
Life cycle annual, perennial ^[1]
Centre of origin West Africa
Stress Tolerance Drought tolerant, requires warm temperatures ^[1].

DISTRIBUTION RANGE



Geographic locations where species has been reported to occur

NUTRITIONAL HIGHLIGHTS

● Protein	● Protein	● Zinc	● Vitamin C	● Protein	● Protein
● Fiber	● Fiber	● Iron	● Iron	● Vitamin C	● Vitamin C
● Folate	● Thiamine	● Copper		● Calcium	● Calcium
● Magnesium	● Niacin	● Potassium		● Iron	● Iron
● Copper	● Vitamin B6	● Phosphorus		● Phosphorus	● Phosphorus
● Manganese	● Folate				
● Phosphorus	● Magnesium				

ETHNOBOTANICAL INFORMATION

The cowpea is a major pulse crop in Africa and parts of Asia. The seeds can be boiled whole or ground into powder which is added to baked goods. The leaves and young pods are eaten as a vegetable by boiling or frying them. The leaves can also be dried and stored for later use. The roots are also sometimes eaten. The whole plant is furthermore given to animals as feed ^[1].

Occurring in farming systems in	Zambia, Uganda, Laos, Zimbabwe
Level of domestication	domesticated
Considered a NUS	no ZAM, LAO • yes UGA, ZIM
Edible parts	leaves ZAM, UGA, ZIM • seeds ZAM, UGA, LAO, ZIM • fruits LAO
Contribution to food group(s)	legumes, nuts and seeds ZAM, UGA, LAO, ZIM • vegetables ZAM, UGA, ZIM • fruits LAO
Popular ways of preparation or preservation	boiled, fried or stir-fried ZAM, UGA, ZIM • steamed ZAM, UGA, LAO • dried ZAM, UGA • raw LAO
Growth place	agricultural field ZAM, UGA, LAO, ZIM • home place, forest ZAM • home garden UGA • roadside, other ZAM, UGA • lake UGA
Commercialization	yes ZAM, UGA, ZIM • no LAO

Nutrition item	Cowpea seeds, boiled ^[a]	Cowpea seeds, dry ^[b]	Cowpea leaves, boiled ^[c]	Cowpea leaves, raw ^[d]	Cowpeas leaves, dried ^[d]
Energy (kcal)	130	349	32	44	277
Protein (grams)	8 ●	21.4 ●	2.21	4.7	22.6 ●
Fiber (grams)	5.8 ●	15.4 ●		2	
Thiamine (mg)	0.17	0.72 ●		0.2 ●	
Riboflavin (mg)	0.04	0.15		0.37 ●	
Niacin (mg NE)	0.7	3.1 ●		2.1	
Vitamin B6 (mg)	0.09	0.36 ●			
Folate (ug DFE)	78 ●	421 ●			
Vitamin C (mg)	0	1	16.88 ●	56 ●	86 ●
Vitamin A (ug RAE or RE)		3			
Vitamin D (ug)	0	0			
Vitamin E (mg)	0.14	0.42			
Vitamin K (ug)					
Calcium (mg)	23	87	0.2	256 ●	1556 ●
Magnesium (mg)	48 ●	195 ●			
Zinc (mg)	1	2.95 ●	0.04		
Iron (mg)	2.3	5.9 ●	5.72 ●	5.7 ●	12 ●
Selenium (ug)		5.8			
Copper (ug)	0.2 ●	0.73 ●			
Manganese (ug)	480 ●				
Sodium (g)	0	20			
Potassium (mg)	389	1220 ●			
Phosphorus (mg)	152 ●	390 ●		63	348 ●
Reference	[2]	[2]	[3]	[4]	[4]

Nutrition information is indicated per 100g of food plant item.

^[a] Cowpea, boiled, [Khobwe wowilitisa] ^[b] Cowpea, dry, [Khobwe/Nseula wouma] ^[c] Cowpea leaves fresh boiled ^[d]

Cowpeas, catjang, leaves, raw ^[e] Cowpeas, catjang, leaves, dried

Nutrients for which no information was found: Pantothenate (ug), Biotine (ug), Vitamin A (ug RAE or RE), Vitamin K (ug), Iodine (ug)



VITEX DONIANA L.

English name
black plum

Scientific name
Vitex doniana L.

Local names
oyellu - Uganda

BOTANICAL INFORMATION

A perennial tree grows up to 25 m tall with a trunk that can grow up to 90 cm in diameter. The bark is greyish-white or pale greyish-brown with cracks and scales. The leaves grow in pairs on opposite sides of the branches and are composed of a leafstalk 5–20 cm long and 5 leaflets that are positioned like the fingers on a hand. The leaflets have a leathery appearance and a distinct yellowish vein in the middle and are oval in shape, 4–25 cm long and 2.5–10.5 cm wide. The flowers are white to pale purple and have 4 lobes of 3 mm long and one lobe of 4.5 mm long. The flowers grow with many together from the base of the leafstalk. The fruit is round to oval in shape, 2–3 cm long, and turns from green with small white dots to purplish black when ripening. The fruit contains a single hard pit with 4 seeds inside^[1].

Growth form tree
Life cycle perennial
Centre of origin tropical Africa^[1]

DISTRIBUTION RANGE



Geographic locations where species has been reported to occur

NUTRITIONAL HIGHLIGHTS

● Magnesium

ETHNOBOTANICAL INFORMATION

The young leaves, ripe fruits, and seeds of the black plum are edible. The leaves are cooked and eaten as vegetables, and the black fruit pulp is eaten fresh or made into jam or beverages. The inside of the seeds is also edible. The wood from the tree is used for carpentry, tool making, and construction purposes, and is also used as fuelwood or to make charcoal. A black dye is made by boiling the leaves, bark, roots, and fruits, and different parts of the plant are used for a wide array of medicinal applications^[1].

Occurring in farming systems in	Uganda
Level of domestication	wild
Considered a NUS	yes
Edible parts	fruits
Contribution to food group(s)	fruits
Popular ways of preparation or preservation	raw
Growth place	agricultural fields, forest, other
Commercialization	no

NUTRITIONAL INFORMATION

Nutrition item	Blackplum fruit, raw ^[A]	Blackplum pulp, ripe, raw ^[B]
Energy (kcal)	104	
Protein (grams)	0.7	0.7
Fiber (grams)	1.3	1.4
Thiamine (mg)	0.02	
Vitamin C (mg)	9	
Calcium (mg)	0.34	25
Magnesium (mg)		18.9
Zinc (mg)		
Iron (mg)	0.27	2.51
Sodium (g)		7.5
Potassium (mg)		580.79 ●
Phosphorus (mg)	0.47	76.59
Reference	[2]	[3]

Nutrition information is indicated per 100g of food plant item.

^[A] Blackplum, fruit, raw ^[B] Chocolate berry/ Black plum, pulp, ripe, raw

Nutrients for which no information was found: Riboflavin (mg), Niacin (mg NE), Vitamin B6 (mg), Pantothenate (ug), Biotine (ug), Folate (ug DFE), Vitamin A (ug RAE or RE), Vitamin D (ug), Vitamin E (mg), Vitamin K (ug), Zinc (mg), Iodine (ug), Selenium (ug), Copper (ug), Manganese (ug)



XANTHOSOMA SAGITTIFOLIUM L.

BOTANICAL INFORMATION

A perennial herb, though often grown as an annual, that grows up to 2 m high with a thick stem and very large leaves. The plant develops about 10 tubers which are cylindrical to cone-shaped, 10–25 cm long, and 10–15 cm in diameter, with brown slightly fibrous skin with horizontal lines, and white, yellow, or pink flesh. The leaves are made up of a leafstalk of up to 1 m long and a very large leaf blade. The leaf blade is shaped like an arrow point, 40–90 cm long and 40–60 cm wide. Cultivated plants rarely flower, but when they do, the flowers are typical aroid flowers, meaning they have a spathe (a large leaf-like structure) growing around a spadix (a stalk containing male and female flower parts). The spathe is up to 14 cm long and creamy yellow, the spadix is up to 18 cm long and creamy white. The plant almost never produces fruits and seeds ^[1].

Growth form	terrestrial herb ^[1]
Life cycle	perennial ^[1]
Centre of origin	Central and South America
Stress Tolerance	Requires average day temperatures above 21°C and annual rainfall of at least 1400 mm ^[1] .

DISTRIBUTION RANGE



Geographic locations where species has been reported to occur

NUTRITIONAL HIGHLIGHTS



● Potassium

ETHNOBOTANICAL INFORMATION

The peeled and cooked tubers of the cocoyam are eaten either boiled, baked, mashed, or fried. The tubers can also be ground into a powder which is used for making pudding and baked foods. The young leaves are also edible after cooking ^[1].

Occurring in farming systems in	Guatemala	Laos
Level of domestication	domesticated	domesticated
Considered a NUS	yes	yes
Edible parts	leaves, tubers	leaves, tubers
Contribution to food group(s)	vegetables	vegetables
Popular ways of preparation or preservation	steamed	steamed
Growth place	agricultural field, home garden, forest	agricultural field, home garden, forest
Commercialization	yes	yes

NUTRITIONAL INFORMATION

Nutrition item	Taro leaves, raw ^[A]	Taro corm, raw ^[B]
Calcium (mg)	39.11	71
Magnesium (mg)	6.77	26
Zinc (mg)	0.07	0.41
Iron (mg)	0.78	1.09
Copper (ug)	0.03	0.11
Manganese (ug)	0	0
Sodium (g)	0	4
Potassium (mg)	63.96	876 ●
Phosphorus (mg)	7.01	51
Reference	[2]	[2]

Nutrition information is indicated per 100g of food plant item.

^[A] Elephant ear/ Giant taro, leaves, raw ^[B] Tania, corm, raw

Nutrients for which no information was found: Energy (kcal), Protein (grams), Fiber (grams), Thiamine (mg), Riboflavin (mg), Niacin (mg NE), Vitamin B6 (mg), Pantothenate (ug), Biotine (ug), Folate (ug DFE), Vitamin C (mg), Vitamin A (ug RAE or RE), Vitamin D (ug), Vitamin E (mg), Vitamin K (ug), Iodine (ug), Selenium (ug)



XIMENIA CAFFRA L.

BOTANICAL INFORMATION

A shrub or small to moderately sized tree that can grow up to 6 m tall with an irregular and open crown and thick spines on the branches. The bark is greyish-brown to black with vertical cracks. The leaves are leathery, blue-green, and oval, 2.5-9 cm long and 1-5 cm wide, and often hairy when they are young. The flowers have 4 petals, are creamy green to whitish, sometimes with pink or red colors, up to 12 mm long and 1-2.5 cm in diameter, and grow with a few together from the base of the spines. The fruit is round to oval, 3.5 cm long, and 2.5 cm wide, turning from green to orange to red when ripening. Each fruit contains 1 seed which is oval in shape, 2.5 cm long, and 1 cm thick, smooth, and colored yellow-brown to red ^[1].

Growth form shrub, tree ^[1]
 Life cycle perennial
 Centre of origin Southern and Eastern Africa ^[2]

DISTRIBUTION RANGE



Geographic locations where species has been reported to occur

NUTRITIONAL HIGHLIGHTS



- Vitamin C
- Iron
- Copper
- Potassium

ETHNOBOTANICAL INFORMATION

The sour plum fruits are eaten raw and have a bitter and sour but refreshing taste. The skin of the fruit is often not eaten as this part is most sour. The fruits can also be mashed to a pulp which is used in porridge, or made into jam. The wood from the tree is used for construction purposes, to make tools and as firewood, and the seeds are roasted and pounded to extract their oil, which is used to soften leather and as a cosmetic for skin and hair ^[1].

Occurring in farming systems in	Zimbabwe
Level of domestication	wild
Considered a NUS	yes
Edible parts	fruits
Contribution to food group(s)	fruits
Popular ways of preparation or preservation	raw, dried
Growth place	forest
Commercialization	no

NUTRITIONAL INFORMATION

Nutrition item	Sour plum, raw ^[A]	Sour plum, fruit flesh, raw ^[B]
Energy (kcal)	69	
Protein (grams)	1.3	1.9
Fiber (grams)	0.4	0.9
Thiamine (mg)		0.03
Riboflavin (mg)		0.02
Vitamin C (mg)		68.2 ●
Vitamin D (ug)	0	
Calcium (mg)	0	8.17
Magnesium (mg)	8	19
Zinc (mg)		0.29
Iron (mg)	6.3 ●	0.49
Copper (ug)		0.17 ●
Sodium (g)	0	1.25
Potassium (mg)	719 ●	558 ●
Phosphorus (mg)	29	35.4
Reference	^[3]	^[4]

Nutrition information is indicated per 100g of food plant item.

^[A] Plum, sour, Ximenia caffra, Mpinjipinji ^[B] Sour, Natal or money plum, fruit flesh, raw
 Nutrients for which no information was found: Niacin (mg NE), Vitamin B6 (mg), Pantothenate (ug), Biotine (ug), Folate (ug DFE), Vitamin A (ug RAE or RE), Vitamin E (mg), Vitamin K (ug), Iodine (ug), Selenium (ug), Manganese (ug)



ZIZIPHUS MAURITIANA L.

BOTANICAL INFORMATION

A perennial tree growing up to 15 m tall with hanging branches. The twigs are zigzagged and at the base of the leaves, there are often spines. The leaves have three clear veins, are round to oval in shape, 2-9 cm long and 1.5-5 cm wide, and are shiny on the upper side and covered with white hairs on the underside. The flowers are 2-3 mm in diameter and are star-shaped with 5 yellow-greenish petals. The flowers grow with 7-20 together from the base of the leaves. The fruits are round to oval, up to 6 cm long and 4 cm wide, with smooth yellow, red, or blackish skin. The flesh is white and crispy when young and mealy when mature, and contains 1 seed with a wrinkled skin ^[1].

Growth form tree
 Life cycle perennial ^[1]
 Centre of origin Middle East and South Asia ^[1]
 Stress Tolerance Tolerates high temperatures, droughts and poor soils ^[1].

DISTRIBUTION RANGE



Geographic locations where species has been reported to occur

NUTRITIONAL HIGHLIGHTS

- Vitamin C
- Calcium
- Magnesium
- Copper
- Potassium

ETHNOBOTANICAL INFORMATION

The ripe fruit of the Indian jujube is eaten raw or made into beverages and drinks. The fruits can also be pounded into powder for making sauces or dried for later use. In Asia, the unripe fruits are eaten, often with salt, as well as the young cooked leaves. The wood from the tree is used for carpentry and tool making and as firewood and charcoal. A brown-grey or reddish dye is made by mashing the bark in water and different parts of the plant are used medicinally to treat indigestion and wounds ^[1, 2].

Occurring in farming systems in	Zimbabwe
Level of domestication	semi-domesticated
Considered a NUS	yes
Edible parts	fruits
Contribution to food group(s)	fruits
Popular ways of preparation or preservation	raw, dried
Growth place	forest
Commercialization	no

NUTRITIONAL INFORMATION

Nutrition item	Jujube, raw ^[A]	Jujube plum, fruit flesh, semi-dried ^[B]
Energy (kcal)	60	
Protein (grams)	0.6	3.2
Fiber (grams)	0.5	2.4
Thiamine (mg)	0.01	0.05
Riboflavin (mg)	0.02	0.08
Niacin (mg NE)	0.6	
Vitamin B6 (mg)	0.05	
Vitamin C (mg)	39	
Vitamin A (ug RAE or RE)	1 ●	
Vitamin D (ug)	0	
Calcium (mg)	20	157
Magnesium (mg)	8	58.5 ●
Zinc (mg)	0.04	0.39 ●
Iron (mg)	0.5	0.73
Copper (ug)	0.04	0.32
Sodium (g)	0	4.01 ●
Potassium (mg)	256	1078
Phosphorus (mg)	32	101 ●
Reference	[3]	[4]

Nutrition information is indicated per 100g of food plant item.

^[A] Jujube, Ziziphus mauritiana, Masau ^[B] Jujube/ Chinese Apple/ Indian plum, fruit flesh, semi dried

Nutrients for which no information was found: Pantothenate (ug), Biotine (ug), Folate (ug DFE), Vitamin E (mg), Vitamin K (ug), Iodine (ug), Selenium (ug), Manganese (ug)



4 REFLECTIONS AND RECOMMENDATIONS

**THIS BOOK
ALSO
HIGHLIGHTS
THE ROLE
THAT LOCAL
FOOD PLANTS
MAY HAVE IN
INCREASING
THE FOOD
RESILIENCE
OF IPSHFS
TO CLIMATE
CHANGE**

4.1 SOME REFLECTIONS ON THE SPECIES

From the information provided in this book, it is possible to distinguish between different categories of local food plants that provide different components to the diet, require different cultivation and/or management, and have different levels of tolerance to environmental stress.

The most common local food plants (shared between countries) are tubers (*Dioscorea* spp., *Colocasia* spp.), vegetables (*Cleome gynandra*, *Bidens pilosa*, *Amaranthus thunbergii*, *Abelmoschus esculentus*, *Hibiscus sabdariffa*, *Brassica oleracea* var. *capitata* and *Brassica capitata*), and pseudo-grains (*Amaranthus* spp.). Furthermore, the reporting on a species as occurring in more than one country may create somewhat biased information, given that similar agroecosystems occur in the programme sites of Uganda, Zambia, and Zimbabwe. Overlaps between Nepal and Laos, as well as between Guatemala and Peru may occur similarly. In other words, such information may suggest a wide adaptability, which in fact concerns the appearance of the food plant in similar agroecosystems. It is interesting to note that in addition to well-dispersed species, all countries report species that really originate in their own region, and have not spread much beyond.

The information presented in this book also highlights the role that local food plants may have in increasing the food resilience of IPSHFs to climate change. This is certainly important, particularly in regions that are most vulnerable to climate change, such as Southern Africa. For this reason, we have included information on stress tolerance, where available, in the species descriptions.

4.2 PROMOTING CHAMPION SPECIES

Among the hundred plants presented in this book, there are some champion species. We named champions those food plants that can play an essential role in addressing micronutrient deficiencies, given their high contents of particular nutrients. Moreover, we named champions those food plants that are available during food scarcity periods, as well as some highly nutritious species that are available throughout the year. Champion species may be popular among farmers in some regions, but less widely known by farmers in other places in the world. Table 6 indicates the most nutritious champion species across the programme countries where they were identified, their nutrition score based on their number of nutrient claims, and their role during food scarcity periods. Please, refer to Appendix 1 for more information on the nutrition claims and the role in food scarcity.

Table 6. Most nutritious champion species across the programme countries

Scientific name	Countries	Nutrition score	Role in Food Scarcity
<i>Abelmoschus esculentus</i> (L.) Moench	Zambia, Uganda	2	super important (Uganda), important (Zambia)
<i>Adansonia digitata</i> L.	Zimbabwe	1	super important
<i>Amaranthus caudatus</i> L.	Peru	2	(unknown)
<i>Amaranthus cruentus</i> L.	Zambia	4	less important
<i>Amaranthus thunbergii</i> Moq.	Zimbabwe	1	very important
<i>Amaranthus tortuosus</i> Hornem.	Uganda	2	important
<i>Avena sativa</i> L.	Peru	3	less important
<i>Cajanus cajan</i> (L.) Millsp.	Uganda	4	very important
<i>Capsicum frutescens</i> L.	Lao	2	less important
<i>Centella asiatica</i> (L.) Urb.	Lao	1	important
<i>Chenopodium pallidicaule</i> Aellen	Peru	2	(unknown)
<i>Chenopodium quinoa</i> Willd.	Peru	2	very important
<i>Cleome gynandra</i> L.	Zambia, Uganda, Zimbabwe	2	super important (Uganda, Zimbabwe)
<i>Crotalaria retusa</i> L.	Uganda	2	less important
<i>Diplazium esculentum</i> (Retz.) Sw.	Lao	1	important
<i>Eleusine coracana</i> Gaertn.	Uganda, Zimbabwe, Nepal	2	super important (Zimbabwe, Nepal), very important (Uganda)
<i>Equisetum arvense</i> L.	Peru	4	less important
<i>Hibiscus sabdariffa</i> L.	Zambia, Uganda, Nepal	1	super important (Nepal)
<i>Lathyrus oleraceus</i> Lam.	Uganda, Peru	2	super important (Peru), important (Uganda)
<i>Lepidium sativum</i> L.	Nepal	1	(unknown)
<i>Lupinus mutabilis</i> Sweet	Peru	2	very important
<i>Manihot esculenta</i> Crantz	Zambia, Uganda, Lao	2	quite important (Uganda), important (Zambia, Lao)
<i>Perilla frutescens</i> (L.) Britton	Nepal	2	(unknown)
<i>Phaseolus coccineus</i> L.	Guatemala	1	very important
<i>Psidium guajava</i> L.	Zambia	1	important
<i>Sesamum indicum</i> L.	Lao	3	less important
<i>Setaria italica</i> (L.) P.Beauv.	Nepal	2	important
<i>Solanum nigrescens</i> M.Martens & Galeotti	Guatemala	1	super important
<i>Taraxacum officinale</i> F.H.Wigg.	Peru	3	less important
<i>Vigna unguiculata</i> (L) Walp.	Zambia, Uganda, Lao	1	super important (Zambia, Uganda)

* Nutrition score is based on the number of nutrition claims each food plant had after the nutritional evaluation, indicating: 4= most nutritious, and 1= least nutritious. Please, refer to Appendix 1 for more information on the nutrition claims and the role in food scarcity.

The champion species above encompass both globally cultivated species and species only known regionally, as well as neglected and underutilised species (NUS). The composition shows how species with diverse status can contribute to improved nutrition. We encourage anyone active with the promotion of local food plants to engage health and nutrition departments, and food and agricultural programmes in the promotion of champion species, in order to better tackle malnutrition while preserving plant biodiversity.

**PLANTS THAT
CAN PLAY AN
ESSENTIAL
ROLE IN
ADDRESSING
MICRONUTRIENT
DEFICIENCIES**

4.3 IMPLICATIONS FOR POLICY AND DECISION MAKING

The information presented in this book highlights the importance of IPSHFs' knowledge as the basis for combatting malnutrition that is locally sound (culturally and environmentally). It also highlights diversity threefold: (a) diversity of plants for diverse and nutritious diets, including diversity of food groups and micronutrients; (b) diversity of agroecosystems and habitats where these species grow, including agricultural fields, forests, and home gardens, among others; and (c) diversity of plants ensuring the seasonal availability of food throughout the year, particularly during the food scarcity period. This implies that any strategy that aims at strengthening the role of local food plants for nutrition, should also take into account the conservation and diversification of the agroecosystems and habitats where these species grow. Healthy and nutritious diets should be promoted together with the conservation of biodiversity at genetic, species, and ecosystem levels, and the recognition of local knowledge and cultures.

The species in this book clearly illustrate the important role that plant biodiversity and local knowledge can play in ensuring food and nutrition security for millions around the world. Local food plants can play a key role in addressing micronutrient deficiencies and reducing the food scarcity period of IPSHFs, not only in the SD=HS programme regions but globally. This potential should be a major consideration in national and regional policy development.



Ekeunos subgroup under MAFA FFS during observations of the different crops in their FFS field

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All images & maps are from <https://www.gbif.org/>

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APPENDIX 1. METHODOLOGY

The following description of the methodology includes: (a) the household survey, (b) the selection of local food plants and their botanical and ethnobotanical characterization, and (c) the nutritional analysis.

Household survey

The household survey took place from 2019 to 2021 at two different times (scarcity season and sufficiency season) in each of the regions where the SD=HS programme was implemented. Data was collected by local enumerators who speak the local language. They were trained by the SD=HS partner organizations, who pilot-tested the questionnaire before collecting the data. The household survey was conducted in a representative sample of communities, representing each agro-ecosystem and ethnic group in the project region. In each selected community, a random household sampling equivalent to 30% of all households living in the community took place to ensure statistical representativeness. For villages with 30 to 100 households, a sample of 30 households was used; for villages with 30 or fewer households, all households were interviewed. Households that were living for less than one year in the community, or households that were not engaged in farming were excluded from the sample. All informants participated freely and with prior informed consent. In total 2991 households were surveyed. Table 7 presents the number of households interviewed in each region per country.

Continent	Country	Number of households	Percentage of households
Africa	Zambia	634	21%
	Zimbabwe	522	18%
	Uganda	644	22%
Latin America	Peru	333	11%
	Guatemala	282	9%
Asia	Nepal	474	16%
	Laos	102	3%
Total		2991	100%

The household survey provided information on the most prominent local food plants based on the analysis of the free listing exercise and distinguished between local food plants acquired in the food scarcity and sufficiency periods.

Free listings aimed at preparing a list of local food plants representative of the knowledge that is shared by community members, by asking informants to list the local food plants they know. Given that knowledge is intrinsically related to gender, this exercise was conducted with both the head of the household and his/her spouse. Men's and women's lists were captured separately to ensure the inclusion of plants that are important for both genders individually.

Once the surveys took place and the database with the results was prepared, the lists of local food plants were carefully revised looking for typos and synonyms in the raw data (comparing local plant names given by different informants), ensuring that there is only one way of writing each local plant name per community to avoid double counting of species when conducting the analysis.

The results of the free listings were analysed by calculating the cognitive salience index (CSI). The CSI combines the frequency and the order of mention across men's and women's lists for each plant species in a single index (the higher the CSI, the higher the knowledge of the specific plant) (Sutrop, 2001). Therefore, the most prominent species in a community were those with higher CSI values. For a detailed explanation of the index see Sutrop, 2001.

The species that are more widely used among households during the food scarcity season were identified using the traffic light exercise (Ocho et al., 2012), in order to ensure that these would also be included in the list of local food plants. For that purpose, once a plant list was completed, the enumerator asked men and women to give a color to each plant in relation to the period when it is consumed most:

- Green light: an affluent period, or when food may not be plentiful but generally is available to the community in adequate quantity and quality.
- Amber light: a problematic situation, when food reserves are alarmingly low.
- Red light: a situation in which the food supply is depleted and which requires emergency measures.

In order to triangulate the results, households were also asked to list the plants that are consumed during times of food scarcity. The complete baseline survey tool is available here:

<https://sdhsprogram.org/document/baseline-tool-on-nutrition-and-local-food-plants/>

Selection and characterization of plants for this book

The analysis of the household surveys produced a list of the 35 most prominent food plants for men, women, and both in each country. In addition, the most prominent plants that were reported to be consumed mainly in times of food scarcity were added to the list, when not present.

These lists were revised by field expert staff – knowledgeable on local agroecosystems and local food plants – from country partner organizations in the regions where the household survey was conducted. They were asked to reduce the list to 30 food plant species, based on the following criteria:

- Food plants representing different food groups (cereals; legumes; roots and tubers; vegetables and fruits; nuts and seeds)
- Food plants selected by participants of FFS focusing on nutrition
- Food plants considered neglected and underutilized (NUS)
- Food plants maintained by community seed banks participating in the programme

In addition, country partner organizations were also asked to provide some botanical and ethnobotanical characteristics of the species. When all countries submitted their lists of selected species, these were merged into a single one and compared. Some species had been selected by two or more countries, while others occurred in the list of one country only. This long global list of food plants was then reduced further into a list of the hundred most important species encountered. The criteria that were used in this final stage were the following:

- Food plants without a botanical identification or with an unclear taxonomy were excluded
- Staples and major crops (i.e. maize, rice, wheat, potato, among others) were excluded
- Food plants that are grown as local food plants at a small scale in IPSHF's communities, even if they make out large-scale industrial crops elsewhere, were included. An example is *Brassica rapa* or rape seed which was reported as a local food plant in Guatemala but is also a major field crop in Europe.
- Condiments were also excluded.

The botanical and ethnobotanical information of the species was validated by a consultant based on the revision of scientific literature. The scientific names were revised following the plant list of Kew Science's Plants of the World Online (POWO, 2023).

Nutritional analysis

The nutritional content of each food plant species was primarily obtained from national Food Composition Tables (FCTs), other regionally relevant FCTs, and the FAO InFoods databases. Table 8 below shows how the selection of the food composition tables was conducted. All FCTs that did not include scientific names for food species were excluded. When no information was available from these datasets, a complementary search of scientific publications was conducted.

Table 8. Food Composition Tables included in the nutritional analysis

Food Composition Tables investigated	Inclusion	For food plants selected by the country-partners	Reason for exclusion
Zambia FCT 4rth edition	Yes	Zambia, Zimbabwe, Uganda	-
Zimbabwe FCT	No	-	No scientific names
Africa FCT	Yes	Zambia, Zimbabwe, Uganda	-
East Africa FCT	No	-	No scientific names
Tanzania FCT	No	-	No scientific names
Mozambique FCT	No	-	No scientific names
Malawi FCT	Yes	Zambia, Zimbabwe, Uganda	-
USDA FCDB	No	-	No scientific names
InFoods Pulses	Yes	All	-
InFoods Analytical Data	Yes	All	-
InFoods Biodiversity	Yes	All	-
Western Africa FCT	No	-	No scientific names
Central America FCT	Yes	Guatemala, Peru	-
Mexico FCT	Yes	Guatemala, Peru	-
Ecuador FCT	Yes	Guatemala, Peru	-
Laos FCT	Yes	Laos, Nepal	-
Peru FCT	Yes	Guatemala, Peru	-
Nepal FCT	Yes	Laos, Nepal	-

When multiple sources of nutritional information for a certain species were available, information in the different entries was compared. Entries fulfilling most of the criteria below were selected as a data source:

- Sufficient information included on nutrients.
- Information corresponded to similar edible parts to what was reported in the ethnobotanical characterization.
- Information on ways of preparation was similar to what was reported in the ethnobotanical characterization.
- Information was collected in the countries where the species was selected.

When nutritional data for a specific species did not fulfil the criteria mentioned above, the next best available and validated sources were chosen. The nutrient content was assessed according to FAO's guidelines for nutrition and health claims (FAO/WHO, 2015). Nutrient claims for a plant (specifying the edible parts and/or ways of preparation) were calculated using equations based on the thresholds presented in Chapter 2 [Table 4]. The following nutrient claims were assigned: (1) a food plant is a source of a particular nutrient, and (2) a food plant is high in a particular nutrient.

ONE HUNDRED LOCAL FOOD PLANTS TO IMPROVE NUTRITION

Species botany, local knowledge, and nutritional qualities