

Adapting agriculture to climate change:
collecting, protecting and preparing crop wild relatives

Republic of the Sudan



Seed Collecting Guide

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The content of this collecting guide is intended only as a general reference for future collecting missions; the contents and data within are not guaranteed to be complete, correct, timely, current or up-to-date at the time of publishing. For general information and resources on collecting crop wild relatives, visit cwrdiversity.org.

Cover photos

TOP LEFT: *Solanum campylacanthum*, Credit: Maria Vorontsova/RBG Kew;

TOP RIGHT: *Sorghum virgatum*, Credit: Prof. Avinoam Danin;

BOTTOM LEFT: *Solanum coagulans*, Credit Maria Vorontsova RBG Kew;

BOTTOM RIGHT: *Ipomoea ochracea*, Credit: Forest & Kim Starr.

This work was undertaken as part of the initiative “Adapting Agriculture to Climate Change” which is supported by the Government of Norway. The project is managed by the Global Crop Diversity Trust with the Millennium Seed Bank of the Royal Botanic Gardens, Kew, in partnership with national and international genebanks and plant breeding institutes around the world. It is implemented in accordance with the International Treaty on Plant Genetic Resources for Food and Agriculture. For further information see the project website: www.cwrdiversity.org/

Many individual scientists, herbaria, genebanks and specialist institutes are contributing advice and information to the Project and these guides. The Project aims to collect the wild relatives of 29 key crops, conserve them in genebanks, and prepare them for use in plant improvement programs to breed new crop varieties adapted to future climates.



The boundaries and names shown on the maps included in this guide do not imply official endorsement or acceptance by the Adapting Agriculture to Climate Change Project. Data source: GADM, Version 1.0 via diva-gis.org

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The Harlan and de Wet Crop Wild Relatives Checklist was developed by Holly Vincent and Nigel Maxted at the University of Birmingham.

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International Center for Tropical Agriculture
Since 1967 *Science to cultivate change*

The Gap Analysis work which informed the list of species included in this guide, and all the map files, were produced by the Gap Analysis team at CIAT: Andy Jarvis, Nora Castañeda, Colin Khoury and Julian Ramirez-Villegas.

RBG Kew is involved in the research and collection phases of the project. This collecting guide was developed based on the work of the Millennium Seed Bank Enhancement Project Species Targeting Team.

Royal Botanic Gardens
Kew



The Crop Wild Relatives Project is led by the Global Crop Diversity Trust. This work was undertaken as part of the initiative.

Specimen data was kindly provided to this project by many individuals and organisations who are listed on the website: <http://www.cwrdiversity.org/home/data-sources>

This data set will be made available for download. Please refer to the website for more information on this dataset.

This collecting guide has been compiled by:

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This collecting guide consists of species profiles and information sheets contained within this folder, alongside a CD which contains localities of the taxa in an excel file.

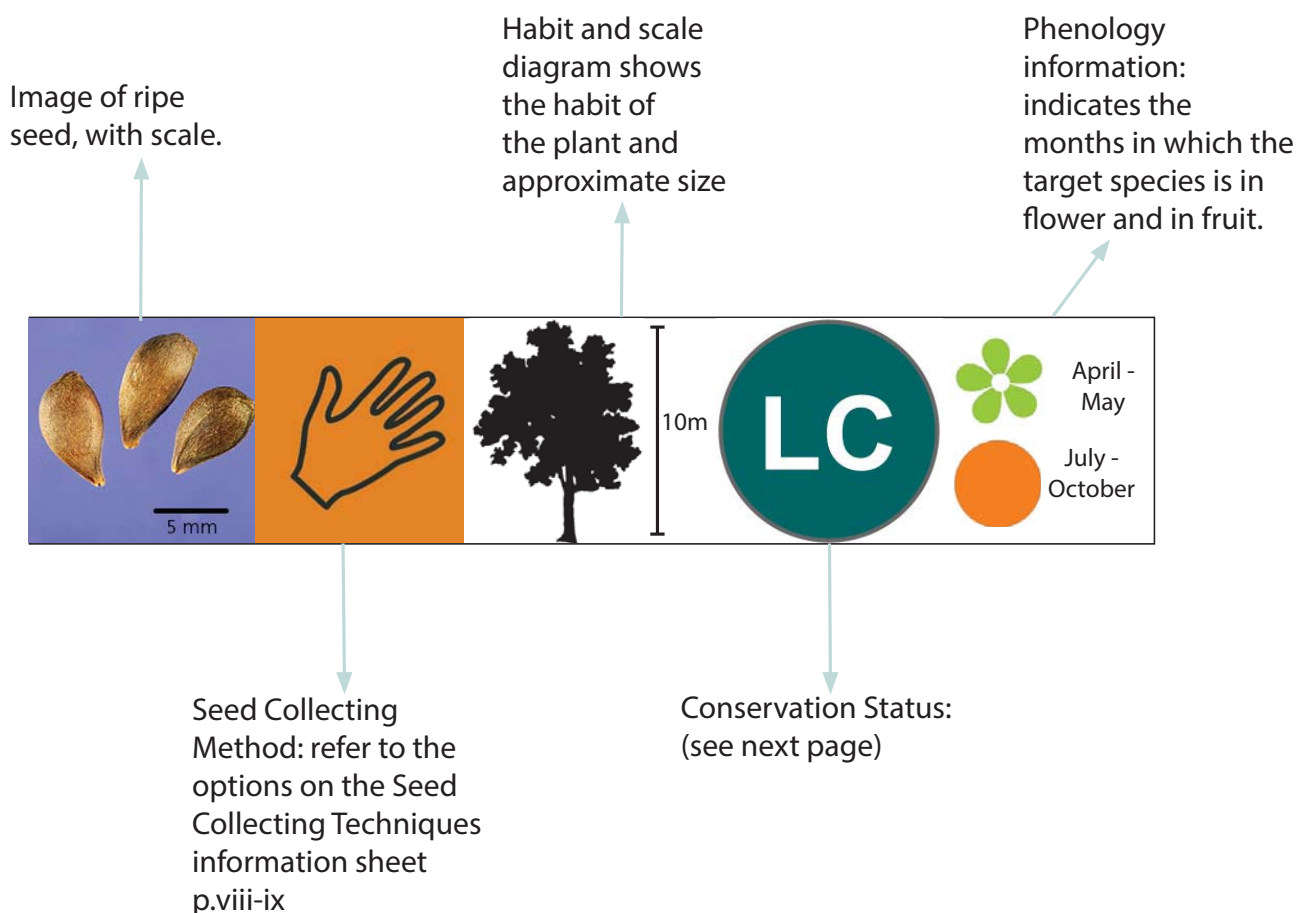
The species included in this guide are a selection of the wild relatives of the 29 key crops which this project covers (African Rice, Alfalfa, Apple, Aubergine, Bambara groundnut, Banana, Barley, Bread Wheat, Butter Bean, Carrot, Chickpea, Common Bean, Cowpea, Faba bean, Finger millet, Grasspea, Lentil, Oat, Pea, Pearl millet, Pigeon pea, Plantain, Potato, Rice, Rye, Sorghum, Sunflower, Sweet potato, Vetch). It is not a definitive guide to the Crop Wild Relatives in this country.

The guides are designed to be used both in the planning of a collecting trip, and also in the field.

At the front of this guide there is a phenology table showing the flowering and fruiting times of all the taxa to indicate which species may be found at a certain time of year, or when to collect target species.

Synonyms for each species are listed in the Appendix at the end of this guide.

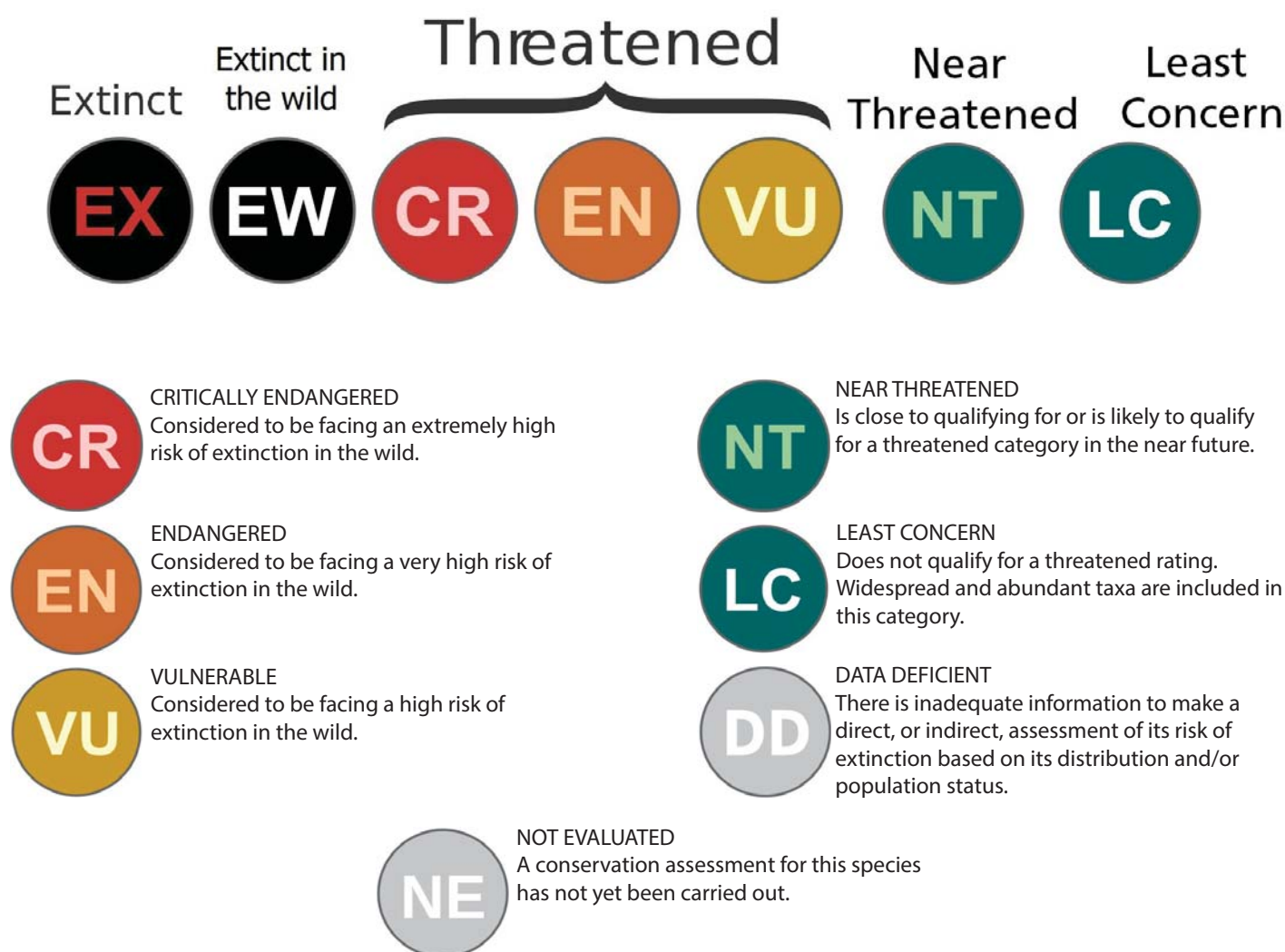
On each species profile, there is a collection of images to help identify the target species, accompanied by a series of symbols :



Conservation Assessments

Conservation Status:

Assessments are completed using 2001 IUCN Red List Categories and Criteria version 3.1 with the following categories:



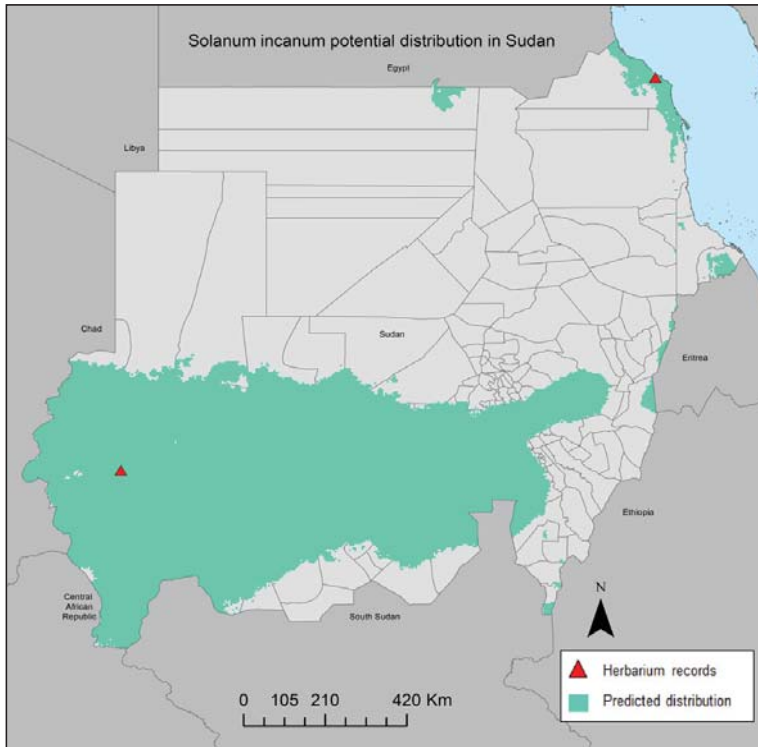
Where a full conservation assessment has not been completed, a preliminary conservation rating may be indicated. Preliminary assessments are produced using specimen locality data and GIS, which calculates two parameters accepted by IUCN as suitable measures of range: namely extent of occurrence (EOO) and area of occupancy (AOO). These values derived for each species are then compared with thresholds set out by IUCN under Criterion B.

Where a preliminary conservation assessment has been calculated this is indicated by the word PRELIM:

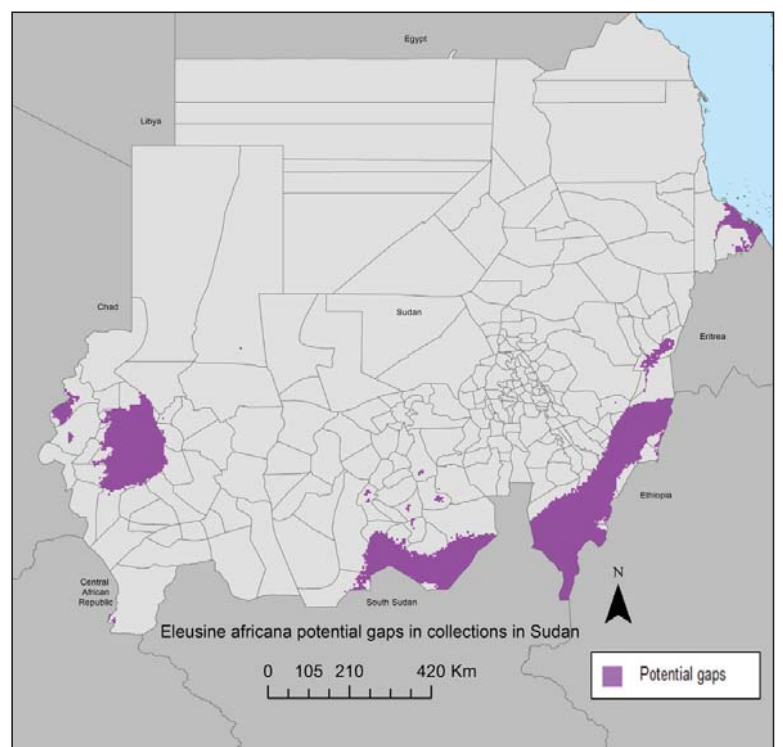


Maps

Two maps are provided for each target species. The first map shows a point distribution of all the known localities of this species based on herbarium specimen records and existing data-sets. The area shaded on this map shows the predicted distribution based on Maxent.



The second map shows the potential gaps in gene bank collections, where seed collections should be targeted.



Useful resources

The following resources are available online.

Kew technical information sheets

- Assessing a potential seed collection:
<http://brahmsonline.kew.org/Content/Projects/msbp/resources/Training/02-Assessing-population.pdf>
- Post-harvest handling of seed collections:
<http://brahmsonline.kew.org/Content/Projects/msbp/resources/Training/04-Post-harvest-handling.pdf>

Other sheets covering the following topics are available from

<http://brahmsonline.kew.org/msbp/Training/Resources>

- Protocol for comparative seed longevity testing
- Measuring seed moisture status using a hygrometer
- Selecting containers for long-term seed storage
- Low-cost monitors of seed moisture status
- Small-scale seed drying methods
- Equilibrating seeds to specific moisture levels
- Identifying desiccation-sensitive seeds
- Seed bank design: seed drying rooms
- Seed bank design: cold rooms for seed storage
- Cleaning seed collections for long-term conservation

ENSCONET seed collecting manual for wild species

http://ensconet.maich.gr/PDF/Collecting_protocol_English.pdf

Seed conservation: turning science into practice

<https://academic.oup.com/aob/article/95/5/888/201951>

Collecting plant genetic diversity: Technical guidelines (Bioversity)

http://cropgenebank.sgrp.cgiar.org/index.php?option=com_content&view=article&id=390&Itemid=557

FAO – Commission on Genetic Resources for Food and Agriculture

<http://www.fao.org/nr/cgrfa/en/>

IUCN Red List Categories and Criteria (Version 3.1)

<https://iucn-csg.org/red-list-categories/>

Plants of the World Online

<http://plantsoftheworldonline.org/>

For more information about the Crop Wild Relatives Project and to access the Harlan and de Wet Crop Wild Relatives checklist, please visit the website:

www.cwrdiversity.org

Identification Keys

Interactive identification keys can be accessed using the links below.

[Kew Grassbase interactive identification key](http://www.kew.org/data/grasses-db/ident.htm)

<http://www.kew.org/data/grasses-db/ident.htm>

Seed Collecting Techniques

Michael Way and Kate Gold, Seed Conservation Department

Seed collecting from wild plants requires care, resourcefulness and determination. There are many different collecting techniques. The most appropriate technique will depend on the species, particularly the type of dispersal unit (fleshy fruit, dry fruit, individual seeds etc). This information sheet outlines the manual techniques most commonly used to make seed collections of adequate quality and quantity, for long term conservation.

Hand picking of whole fruits

The most basic and flexible of techniques, hand picking or plucking, has many benefits. Consider though, if you can use a more efficient technique.



Plucking is particularly suitable when:

- target fruits can easily be selected by eye (e.g. due to colour or texture change of fruit coat, or swelling of fruit);
- non-target (e.g. immature or damaged) fruit cannot be excluded from the collection by more efficient techniques;
- fruits are easily accessible and collectors can tie buckets or similar containers around the waist, releasing both hands for collecting;
- collecting many-seeded fleshy or dry indehiscent fruits; and
- making small seed collections.

Pruning clusters of fruit

This technique is typically used to collect tree seeds. Cut groups or clusters of fruits using secateurs or tree pruners. Assess for ripeness and damage before adding seeds to the collection.

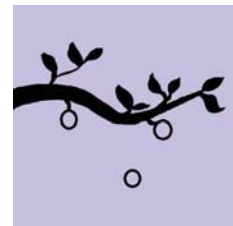


This is a very effective technique when:

- seed is clustered at the distal (terminal) parts of branches;
- the species is abundant and a small associated loss of branch and foliage is acceptable;
- seed is beyond reach of the collectors and has to be obtained using tree pruners.

Shaking branches

Careful shaking of branches will sometimes dislodge the best available seed, which can be collected in buckets or on a tarpaulin held or spread out beneath the plant. Start with gentle taps, and carefully check each sample of seed dislodged. Light shaking will often dislodge fully ripe fruits and seeds, leaving immature, poorly developed and damaged seeds to be retained on the parent plant. Too-heavy beating of branches may cause damage to the tree, and may also dislodge other plant material and associated insects, necessitating additional cleaning of the collection.



Shaking branches may be useful when collecting:

- dehiscent fruits with medium large seeds;
- seeds with irritant plumes (e.g. *Cercocarpus* of the Rosaceae);
- spiny trees such as *Prosopis* (Fabaceae);
- on level, open terrain suitable for tarpaulin use.

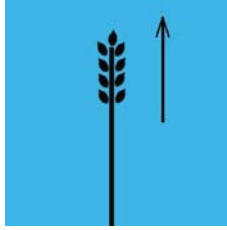
This technique may not be suitable for light, plumed seed from *Bombacaceae* and *Asclepiadaceae*, which may be carried away by air currents.



ABOVE: Stripping seed heads may be appropriate for grasses
Credit: Global Crop Diversity Trust/Britta Skagerfalt

Stripping entire seed-heads

This is a popular technique for collecting seed from grasses and may be suitable for other species with erect infructescences (seedheads). Grasp the seedheads at the base with a gloved hand and slide the hand upwards, dislodging many or all of the seeds. This technique may introduce a proportion of immature seeds into the collection. Such seeds might need further postharvest ripening which can be time consuming and is best avoided.

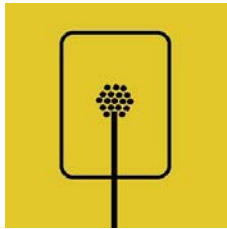


The stripping technique is most suitable for:

- dense, mono-specific stands of target species with no weed or other species present; and
- infructescences which are completely and consistently at the natural dispersal stage.

Bagging seed-heads

If there is frequent access to the collecting site, and if seeds would otherwise be lost, fix a well-tied mesh bag loosely over pre-dispersal seed heads. Seeds are captured as soon as they are shed, and can be periodically removed. This has been successfully used on a small scale, e.g. for collecting *Fouquieria* sp.



Collecting from the ground

You will frequently find seeds on the ground below trees or shrubs, but they will often be damaged by pests or pathogens. The seeds may have been on the ground for several months, and could even date from the previous year. Such seed will have aged and life-span in storage will be reduced. Inspect the seed carefully, noting any variation in the fruit, seed coat and internal tissues.



In general, only collect from the ground when:

- the parent tree(s) can be determined without doubt;
- you are certain that you are collecting recently dispersed seeds;
- seeds have not suffered significant damage from pests or pathogens; and
- other techniques or collecting options are unsuitable.

Collecting fleshy fruits

- Collect fleshy fruits directly into strong plastic bags or tubs with as much air as possible.
- Pack the bags in a rigid plastic container to ensure that the fruits are not squashed and help prevent them getting too hot and fermenting during transit.
- You may need to remove the seeds from fleshy fruits either during or immediately after the field trip.



ABOVE Collecting small seeds into paper bags
Credit: Ruth Harker/ RBG Kew

Containers

Collect into buckets, cloth or paper bags, and check each person's sample carefully before combining into a single population collection.

Using buckets has the advantage of allowing you to monitor the quality of the collection whilst associated insects disperse freely.

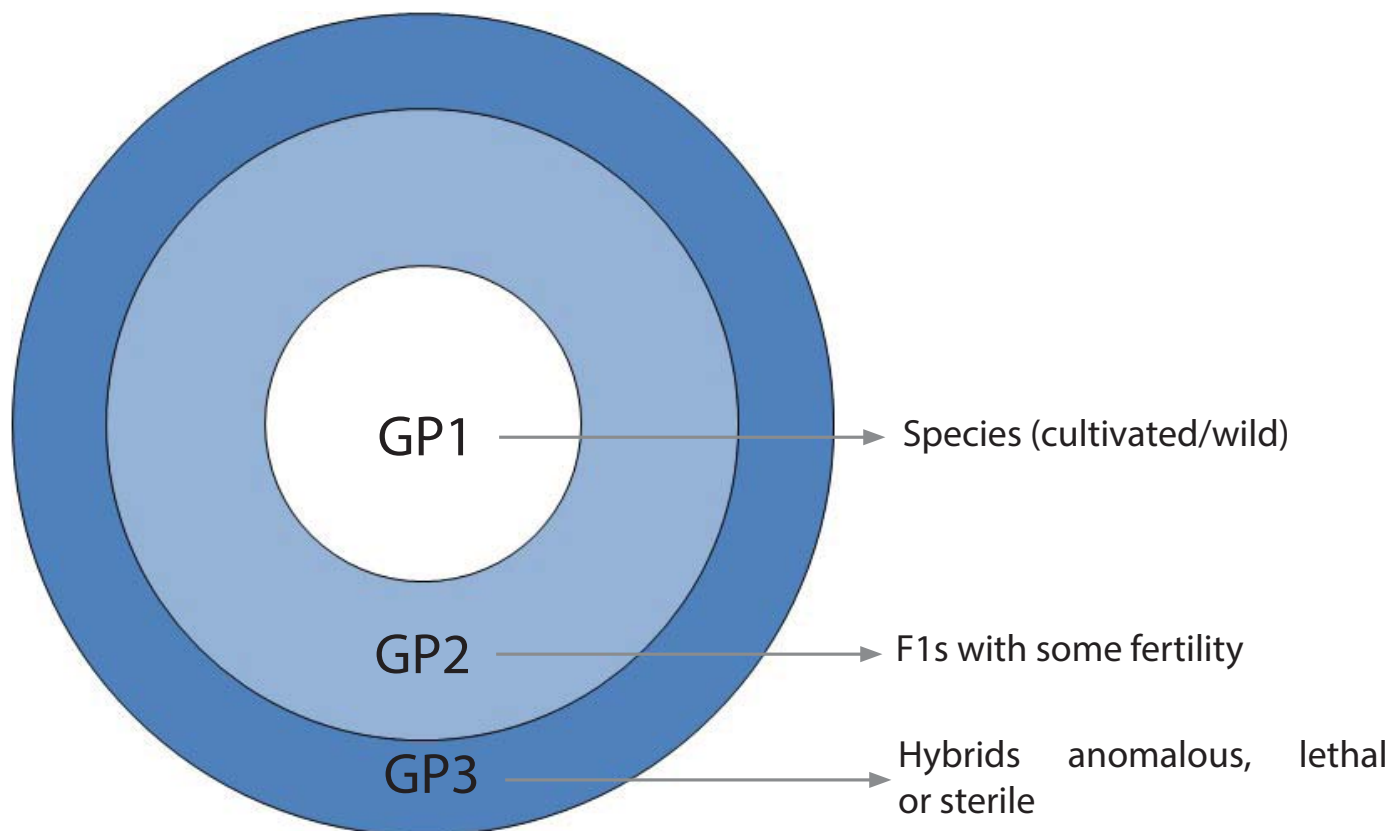
Place collections of dry, ripe seed into cloth or paper bags for transit. Store any awned seed or hooked fruit, that would damage or get stuck in cotton bags, in cardboard boxes or strong paper bags. Never collect or store seeds in plastic bags.

Label all seed containers inside and out with a unique collection number, and seal them securely. It is best to prepare sufficient labels before filling the containers.

Each target species in this guide is a wild relative of a crop. On each species profile it is indicated how closely related the target species is to the crop using either the Gene Pool concept or the Taxon Group concept. Species more closely related to the crop are higher priorities for collecting.

Gene Pool Concept

Harlan and de Wet, 1971



Taxon Group Concept

Maxted et al. 2006

Taxon Group 1 – cultivated/wild form of the crop

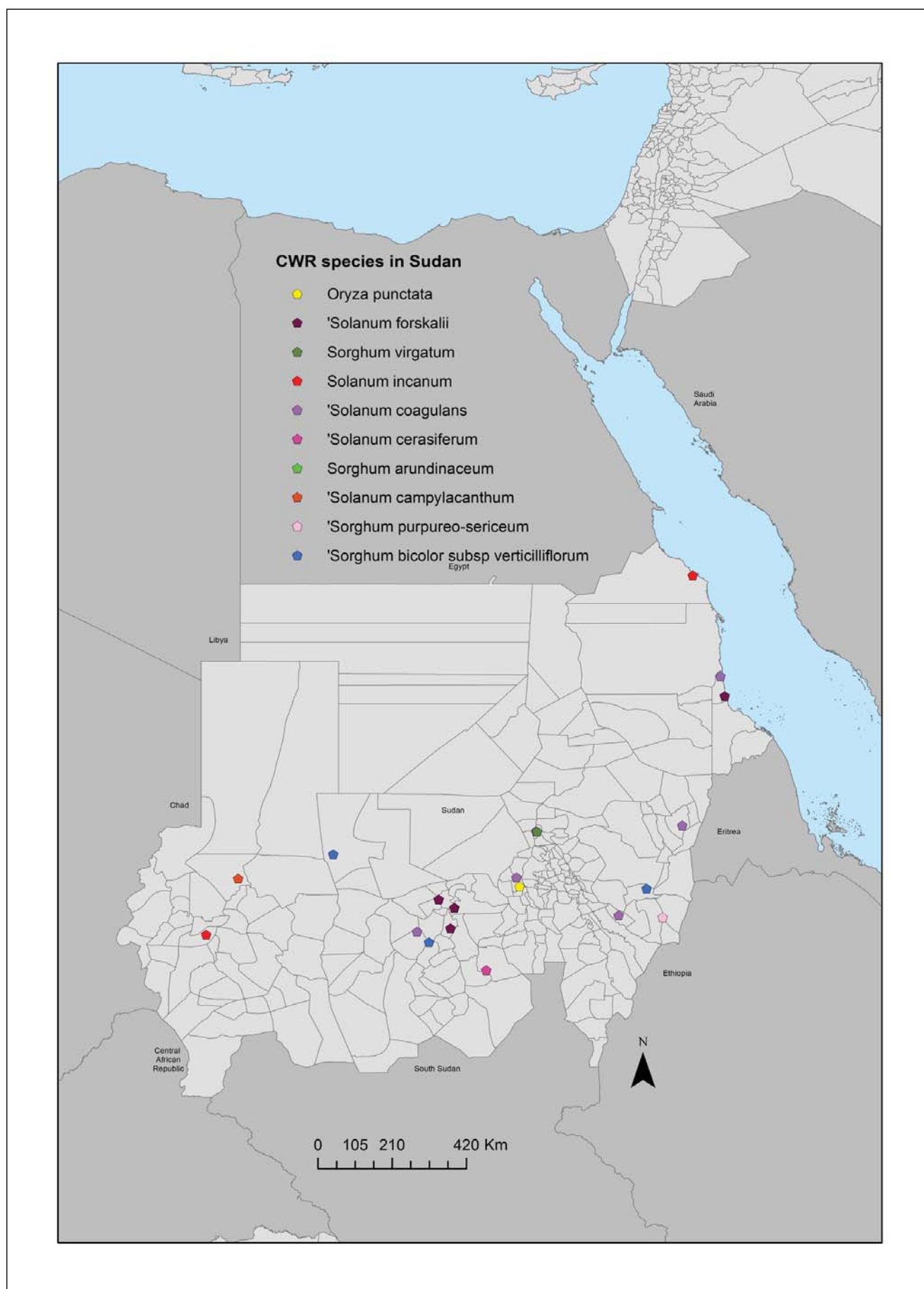
Taxon Group 2 – species in same series/section as crop

Taxon Group 3 – species in same subgenus as crop

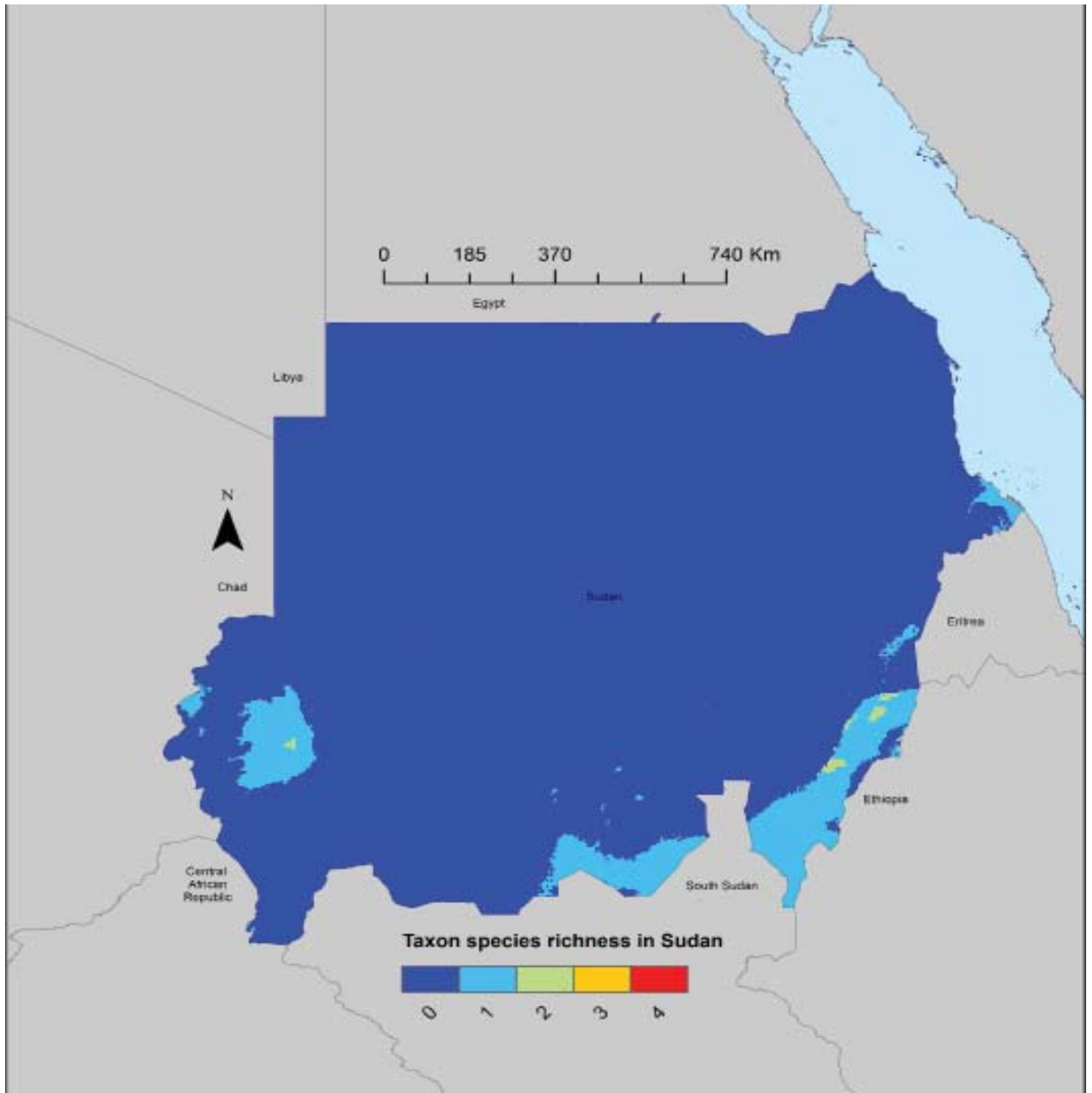
Harlan, J. and J. de Wet (1971). Towards a rational classification of cultivated plants. *Taxon* 20: 509-517.

Maxted, N., B.V. Ford-Lloyd, S.L. Jury, S.P. Kell and M.A. Scholten (2006). Towards a definition of a crop wild relative. *Biodiversity and Conservation* 14: 1-13.

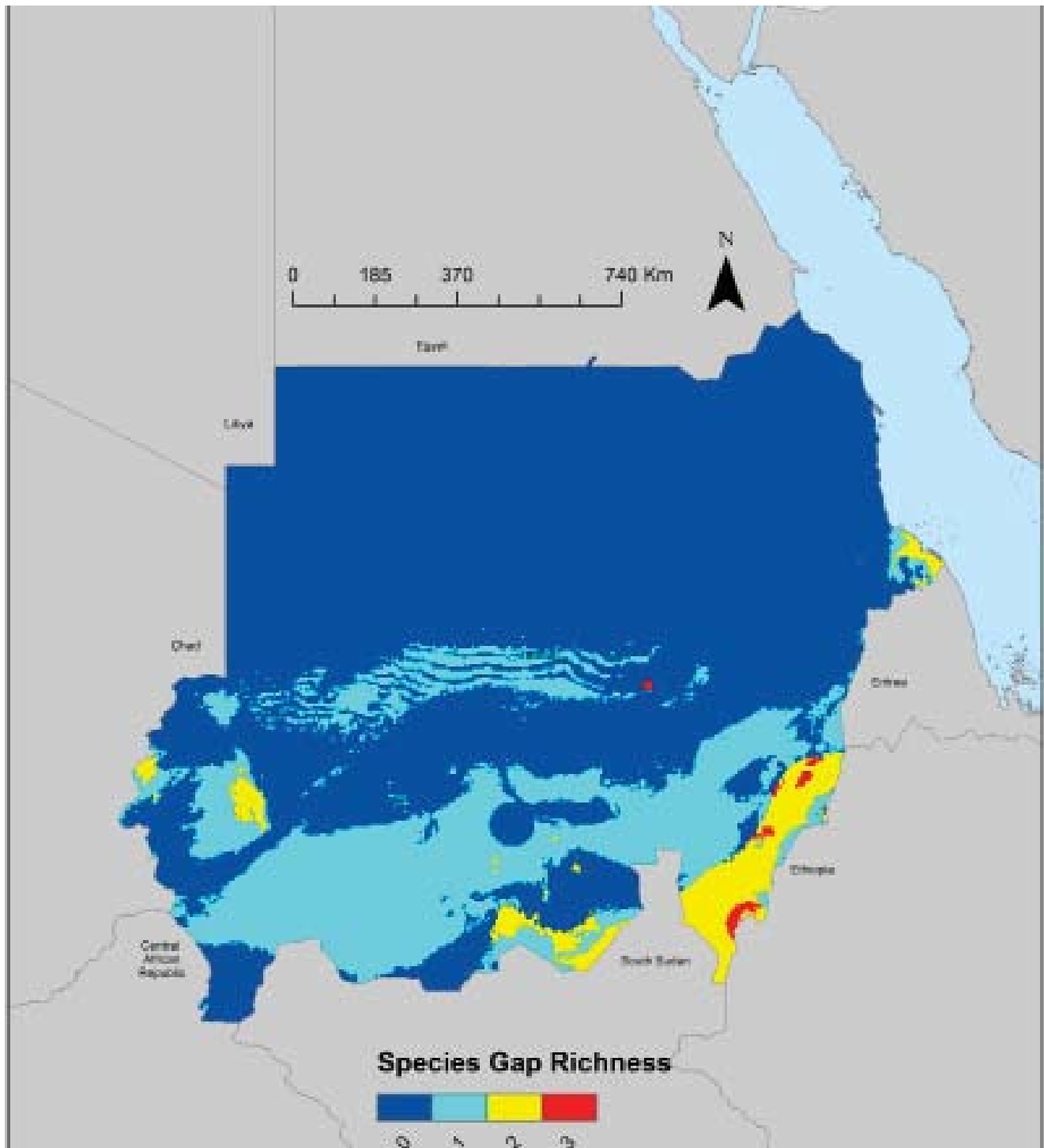
Occurences of all taxa in this guide, as a point distribution



Species richness



Gap richness



Species in this guide

Species profiles are arranged alphabetically by family and taxon.

Family	Taxon	Genepool	Collection Priority	Sheet
Convolvulaceae	<i>Ipomoea ochracea</i>	Sweet Potato	Low	1
Leguminosae	<i>Cicer cuneatum</i>	Chickpea	Low	2
Leguminosae	<i>Vicia sativa</i> subsp. <i>nigra</i>	Vetch	Low	3
Leguminosae	<i>Vigna ambacensis</i>	Bambara	Low	4
Leguminosae	<i>Vigna luteola</i>	Bambara	Low	5
Leguminosae	<i>Vigna multinervis</i>	Bambara	Low	6
Leguminosae	<i>Vigna reticulata</i>	Bambara	Low	7
Leguminosae	<i>Vigna schimperii</i>	Bambara	Low	8
Leguminosae	<i>Vigna vexillata</i>	Cowpea	Low	9
Poaceae	<i>Eleusine africana</i>	Finger Millet	High	10
Poaceae	<i>Eleusine indica</i>	Finger Millet	High	11
Poaceae	<i>Oryza barthii</i>	Rice	Low	12
Poaceae	<i>Oryza brachyantha</i>	Rice	Low	13
Poaceae	<i>Oryza longistaminata</i>	Rice	Low	14
Poaceae	<i>Oryza punctata</i>	Rice	Low	15
Poaceae	<i>Pennisetum glaucum</i> subsp. <i>monodii</i>	Pearl Millet	High	16
Poaceae	<i>Pennisetum stenostachyum</i>	Pearl Millet	High	17
Poaceae	<i>Sorghum arundinaceum</i>	Sorghum	Low	18
Poaceae	<i>Sorghum bicolor</i> subsp. <i>verticilliflo-</i>	Sorghum	High	19
Poaceae	<i>Sorghum purpureosericeum</i>	Sorghum	High	20

Species in this guide

Species profiles are arranged alphabetically by family and taxon.

Family	Taxon	Genepool	Collection Priority	Sheet
Poaceae	<i>Sorghum virgatum</i>	Sorghum	Low	21
Solanaceae	<i>Solanum campylacanthum</i>	Eggplant	High	22
Solanaceae	<i>Solanum cerasiferum</i>	Eggplant	High	23
Solanaceae	<i>Solanum coagulans</i>	Eggplant	Low	24
Solanaceae	<i>Solanum dasyphyllum</i>	Eggplant	High	25
Solanaceae	<i>Solanum forskalii</i>	Eggplant	Low	26
Solanaceae	<i>Solanum incanum</i>	Eggplant	High	27

Phenology table

Taxon	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
<i>Pennisetum stenostachyum</i>												
<i>Sorghum arundinaceum</i>												
<i>Sorghum bicolor</i> subsp. <i>verticilliflorum</i>												
<i>Sorghum purpureosericeum</i>												
<i>Sorghum virgatum</i>												
<i>Solanum campylacanthum</i>												
<i>Solanum cerasiferum</i>												
<i>Solanum coagulans</i>												
<i>Solanum dasyphyllum</i>												
<i>Solanum forskalii</i>												
<i>Solanum incanum</i>												

KEY

 Species in flower

 Species in fruit



Data gathered from literature and herbarium specimens

HABIT: Vines, stems twining, herbaceous, up to ca. 3 m long, glabrous.

LEAVES: Leaf blades chartaceous, cordate, 3.5-6 cm long, 3-5 cm wide, glabrous, margins entire, apex narrowly acuminate to acute, mucronulate, petioles up to 8 cm long.

INFLORESCENCE: Flowers solitary, axillary, or few in cymes, pedicels 5-40 mm long; sepals unequal, inner ones ovate, larger than outer ones, ca. 6 mm long, ca. 3 mm wide, apex acute, base rounded, outer ones ca. 5 mm long, ca. 2.5 mm wide, apex acuminate, mucronate, base rounded, all sepals glabrous, minutely verrucose, margins scarious

FLOWER: Corolla yellow, purple within tube, funnelform, 2.5-4 cm long.

FRUIT: Capsules brown, ovoid, 1.0-1.5 cm long, 0.5-0.7 cm in diameter, glabrous.

SEEDS: Often 4, sometimes fewer, black, globose to ovoid, ca. 4 mm in diameter, glabrous to puberulent.



Habitat:

Grows in lower elevation, mesic (moderately wet) disturbed areas.

Distribution:

Found throughout the tropics.

Altitude: Up to 600 m

<i>Ipomoea ochracea</i>		May be confused with: <i>Ipomoea obscura</i>	
Corolla bright yellow.		Corolla white or pale yellow.	

Reported from Sudan
but no localities known

All populations priority for
collection

References: Wagner, W.L., Herbst, D.R. & Sohmer, S. H. (1999) Manual of the flowering plants of Hawaii. Revised edition. Material for seed image provided by IBPGR.

CONVOLVULACEAE

Ipomoea ochracea (Lindl.) G. Don

Wild relative of sweet potato

Yellow morning glory



Forest & Kim Starr



Forest & Kim Starr

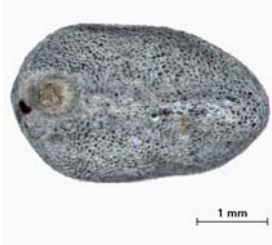


Forest & Kim Starr



Forest & Kim Starr

Gemma Toothill (c) Board of Trustees RBG Kew



Up to 3 m



Jan - Dec

Jan - Dec

Gene Pool Tertiary relative of *Cicer arietinum* L.

Ait shembra (rat's chickpea, Amharic)

HABIT: Annual. Erect or semi-erect herb, more or less climbing habit, few branches at the base, glandular pubescent. Stems flexuous in the upper part, faintly ribbed, 40-60 cm.
LEAVES: Lower ones 8-10 leaflets, upper ones to 22 leaflets, opposite or nearly so, rachis (3)5-7(9) mm long, grooved above, mostly ending in a branched tendril, at the lower leaves also with end leaflet. Leaflets fairly close, narrow-cuneate, base cuneate, top oval-dentated, 5-10 mm long, 205 mm wide, both sides clearly veined, lower side greyish green, upper side green, teeth triangular, pointed, up to 2 mm long, tooth of midrib often recurved. Stipules incised-fan-shaped, up till 7 mm, 2-4(5) teeth, clearly ribbed, longest tooth at the side of the leaf.
FLOWER: 1-flowered axillary racemes, peduncle up till 30 mm long, ending in a slender arista, 4-12 mm long, bracts minute perules, petiole about 5 mm, recurved after the bud stage. Calyx slightly dorsally gibbous at the base. Ovary ovate, 3 mm long, 4 ovules, style 4 mm, upturned.
FRUIT: Elliptic-obtuse, 15-23 mm, 7-10 mm wide, dehiscent, 2-4 seeded.
SEEDS: Globular, diameter 3-4 mm, seed coat brownish to black (when ripe), regularly finely tuberculate, chalazal tubercle black, hilum hardly elevated.

Habitat:

Harvested fields, open vegetation.

Distribution:

Ethiopia, Egypt, Saudi Arabia.

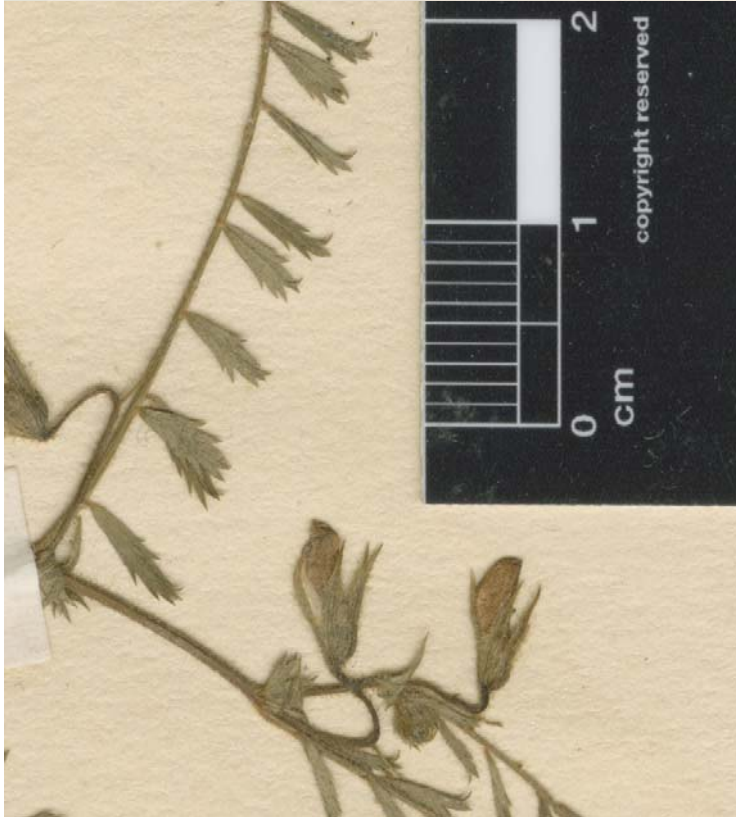
Altitude: 1000 - 2200 m

<i>Cicer cuneatum</i>	May be confused with:

Reported from Sudan
but no localities known

All populations priority for
collection

References: Van der Maesen, L.J.G. 1972. *Cicer* L., monograph of the genus, with special reference to the chickpea (*Cicer arietinum* L.), its ecology and cultivation.



40 - 60 cm



HABIT: Annual with scrambling and climbing growth habit, 10-70 cm long. Stems arising from the base hollow, squarish in cross-section. Slender taproot system with numerous lateral branches.

LEAVES: Compound pinnate with 3-8 pairs of opposite leaflets and 2-3 terminal tendrils. Leaflets narrowly oblong, square at the apex and with a small projecting mid rib, usually less than 10 mm broad. Stipules small and divided.

INFLORESCENCE: Flowers solitary or paired, on short peduncles arising at the base of the leaves, mainly blue to purple but sometimes white.

FLOWER: Calyx 7-12 mm, teeth c. 2.5-8 mm. Corolla 10-20 mm.

FRUIT: Pods narrow.

SEEDS: 4-12 per fruit, flattened, black to greyish in colour, sometimes marbled, 2.5-4 mm.

Habitat:

Agricultural and disturbed land, margins of woodland.

Distribution:

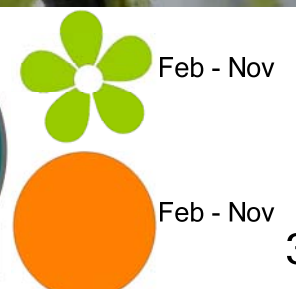
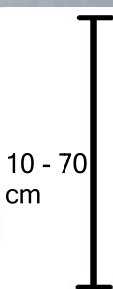
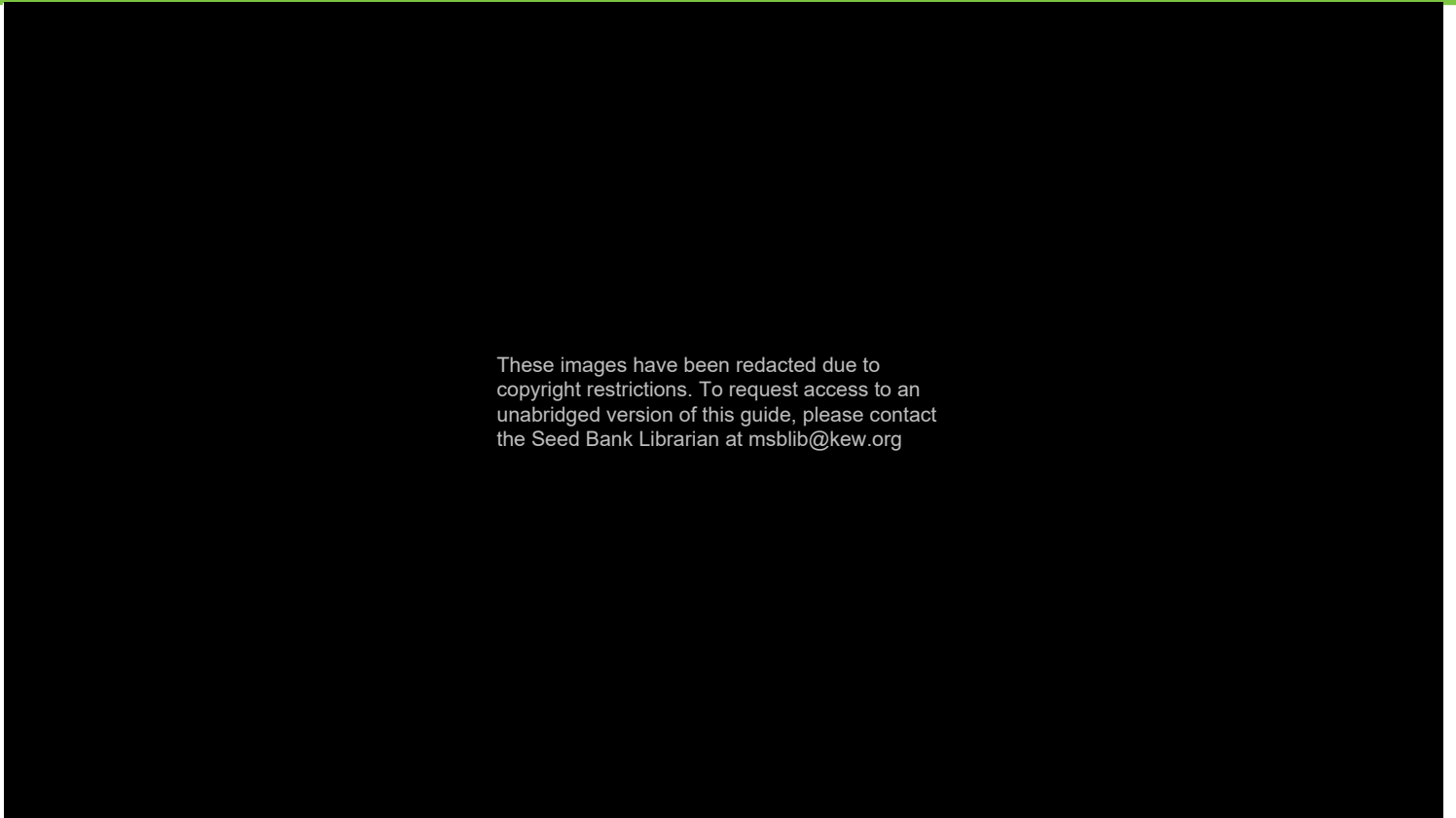
Common pan-temperate and semi-tropical weed.

Altitude: 0 - 2900 m

<i>Vicia sativa</i> subsp. <i>nigra</i>	May be confused with: <i>Vicia sativa</i> subsp. <i>sativa</i>
Pod black or brownish black, not contracted between seeds, 25-55 × (2.5-)3-6 mm; usually glabrous.	Pod brown or yellow-brown, contracted between seeds, 35-70 × 6-11 mm, usually hairy.

Reported from Sudan
but no localities known

All populations priority for
collection



HABIT: Annual or perennial climbing herb, 0.9-7 m long. Stems covered with spreading often ferruginous hairs.
LEAVES: Leaflets 3, 2.5-15 cm long, sparsely to densely pubescent on both surfaces; petiole 1.5-7 cm long; rachis 0.4-1.7 cm long; petiolules 1.2 mm long; stipules ovate-lanceolate, 2-5 mm long, slightly bilobed at the base.
INFLORESCENCE: Axillary; rachis 1-4 cm long, conspicuously glandular; peduncle 1.5-15 cm long; pedicels 3-5 mm long; bracteoles subpersistent, ovate-lanceolate, 1.5-5 mm long.
FLOWER: Calyx pubescent; tube 2-3 mm long. Standard white, yellow or brownish outside, often tinged greenish-purple, blue or violet inside, broadly obovate, 1-2.2 cm long, 1.5-2.5 cm wide, pubescent or velvety outside with adpressed hairs; wings yellow or white tinged violet at the apex or all mauve or blue; keel yellow, white or purple with the beak neither curved or twisted.
FRUIT: Pods linear, compressed, 2.7-6 cm long, 4-7 mm wide, pubescent, 4-8 seeded.
SEEDS: Greenish or reddish brown, mottled with darker brown or black, oblong, longest dimension 4-5.5 mm., shorter dimension 2-3.5 mm., 2 mm thick; aril eccentric, yellowish, 2.3 mm long, the central prong very short, acute.

Habitat:

Herbaceous (mainly grassland) and tree savannahs, roadside, weed of cultivation, swamps and fallows.

Distribution:

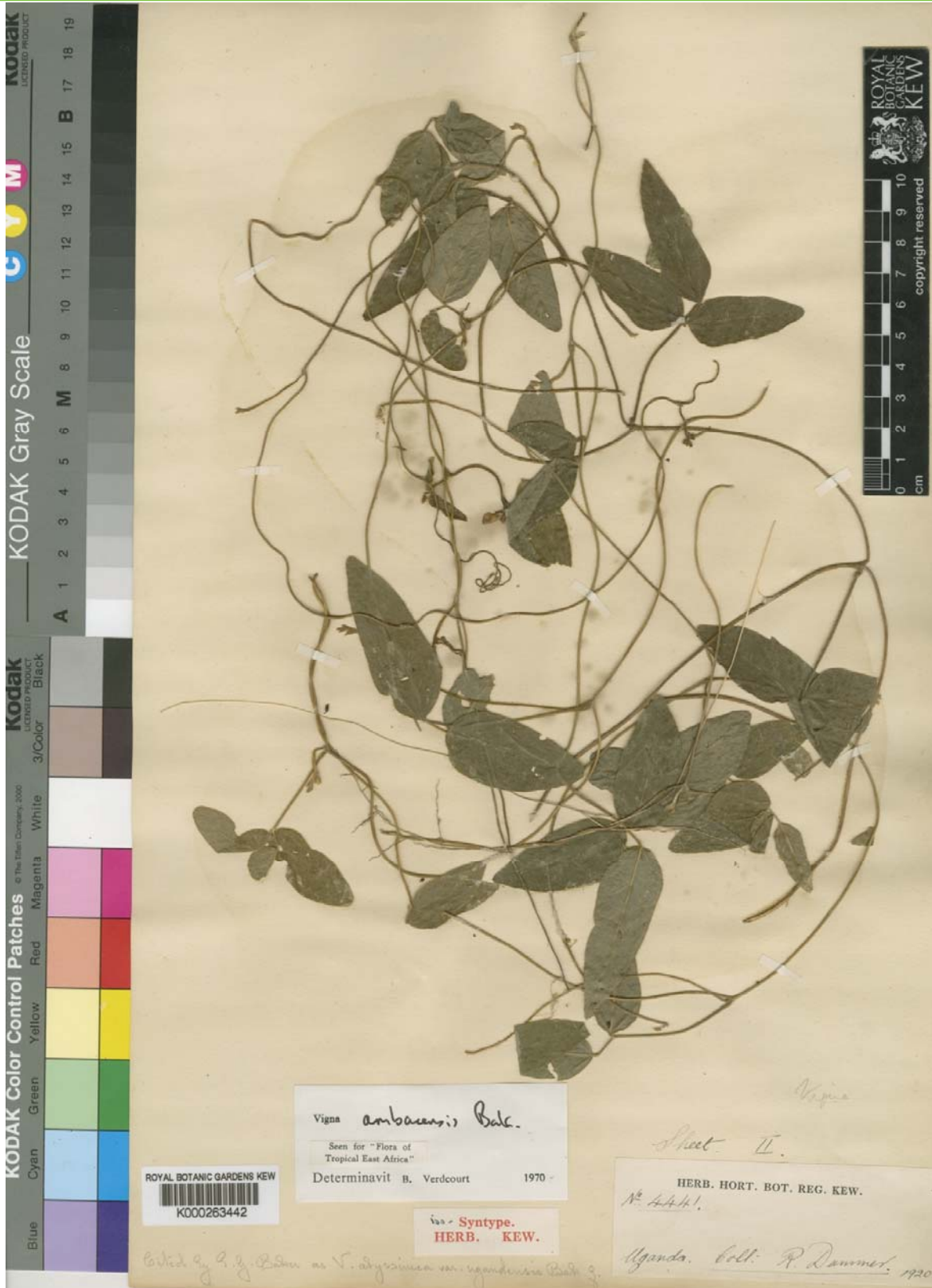
Throughout tropical Africa.

Altitude: 1 - 1400 m

<i>Vigna ambacensis</i>	May be confused with: <i>Vigna heterophylla</i>
Calyx lobes wider and blunter, much shorter than the calyx tube; calyx and fruit indumentum mostly adpressed.	Calyx lobes longer and narrower; calyx and fruit indumentum mostly spreading.

Reported from Sudan
but no localities known

All populations priority for
collection



Up to
7m



Sep - Dec

Sep - Dec

HABIT: Twining or trailing perennial herb 1.8-6 m long. Stem sparsely covered with appressed hairs to densely covered with spreading ferruginous hairs, glabrescent.

LEAVES: Leaflets 3, 2.5-10 × 0.6-4.5 cm, ovate-lanceolate to lanceolate, more rarely linear-lanceolate; petiole 1.5-8.5 cm long; rhachis 0.5-1.8 cm long; stipules 2-5 × 1.5-2 mm, ovate to linear-lanceolate, bilobed at the base, multinerved.

Peduncle 12-35 cm × 0.8-3 mm, glabrous; rhachis 1.5-5.5 cm long, 5-15-noded, internodes 1-8 mm long.

FLOWER: Yellow, 12-20 × 14-22 mm; pedicel 3-7 mm long, expanding as the pod matures; bracteoles 1.5-4 × 1 mm, ovate-lanceolate to linear-lanceolate, 1-3-nerved. Calyx glabrescent to densely hairy; tube 2-4 mm long; lobes 1.5-4 mm long; the lower one almost twice as long as the others, the upper pair united into an acute, rounded and mucronate, or slightly bilobed lip. Standard with two centrally placed appendages; keel slightly twisted towards the right, with a short beak. Ovary 7-12-ovuled.

FRUIT: Pods 5.5-8 cm × 4-6.5 mm, linear, slightly compressed, curved, slightly constricted between the seeds, sparsely to densely covered with spreading ferruginous hairs, with a short curved beak.

SEEDS: 3.5-4.5 × 3-3.5 × 2-2.5 mm; hilum almost central, 1.5 mm long, oblong; rim aril not or scarcely developed.

Habitat:

Grassland, lake edges, riverbanks, swamp edges, sclerophyllous forests, around cultivated fields and other disturbed areas, often associated with wet environments.

Distribution:

Throughout Africa.

Altitude: 1 - 2800 m

<i>Vigna luteola</i>	May be confused with: <i>Vigna marina</i>
Smaller pod and seeds: Pod 4-6.5 mm wide; seed 3.5-4.5 mm long, 3-3.5 mm wide.	Larger pod and seeds: Pod 7-9 mm wide; seed 5.5-7 mm long, 4.5-6 mm wide.

Reported from Sudan
but no localities known

All populations priority for
collection

Hairy-pod cowpea;
Seabean, Akwari



Credit: P. Acevedo, courtesy of Smithsonian Institution



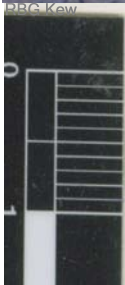
Credit: S. Campton, courtesy of Smithsonian Institution



Credit: R.A. Howard, courtesy of Smithsonian Institution



Credit: R.A. Howard, courtesy of Smithsonian Institution



Up to
6m



Jan - Dec

Jan - Dec

HABIT: Perennial climbing or trailing herb, 0.3-2 m long. Stem slender, wiry, glabrous.

LEAVES: Leaflets 3, 6-15 × 0.2-1.3 cm, oblong-lanceolate to lanceolate, acuminate to somewhat rounded and mucronulate at the apex, rounded or subcordate at the base, rather thick, glabrous except for some marginal papillae; lateral nerves very numerous, forming a right-angle with the midrib; venation raised and reticulate on both surfaces; petiole 2-7.5 cm long; rhachis 1-5 mm long; stipules 2-4 mm long, ovate-lanceolate, prolonged and cordate at the base, multinerved. Peduncle 0.5-10 cm × 0.2-0.8 mm, glabrous, 2-7-noded, internodes 1-5 mm long, rarely up to 8 mm.

FLOWER: Yellow, 8-10 × 8-12 mm; pedicel 1.5-3 mm long, not expanding as the pod matures; bracteoles 1.5-2 mm long, ovate-lanceolate, 1-nerved. Calyx glabrous or sparsely pubescent; tube 2 mm long; lobes 1-2 mm long, deltate, ciliate, lower as long as the laterals; upper pair united to form a slightly emarginate lip. Standard with two central appendages; keel slightly twisted towards the right, the beak short. Ovary 8-10-ovuled.

FRUIT: Pod 5-6 cm × 4-5 mm, linear-cylindrical, almost straight, compressed, glabrous or glabrescent, with a small curved beak.

SEEDS: 2.8-3 × 1.5-2 × 1.2 mm; hilum excentric; aril excentric, well developed.

Habitat:

Grasslands, herbaceous savannahs, woody savannahs, dambos, permanently wet dunes, waste grounds, fallow fields and rarely in bogs, often on stony, sandy soil.

Distribution:

Throughout Tropical Africa.

Altitude: 1 - 1850 m

Vigna multinervis

May be confused with:
Other Vigna species

Very characteristic venation of numerous lateral nerves forming a right angle with the mid-rib.



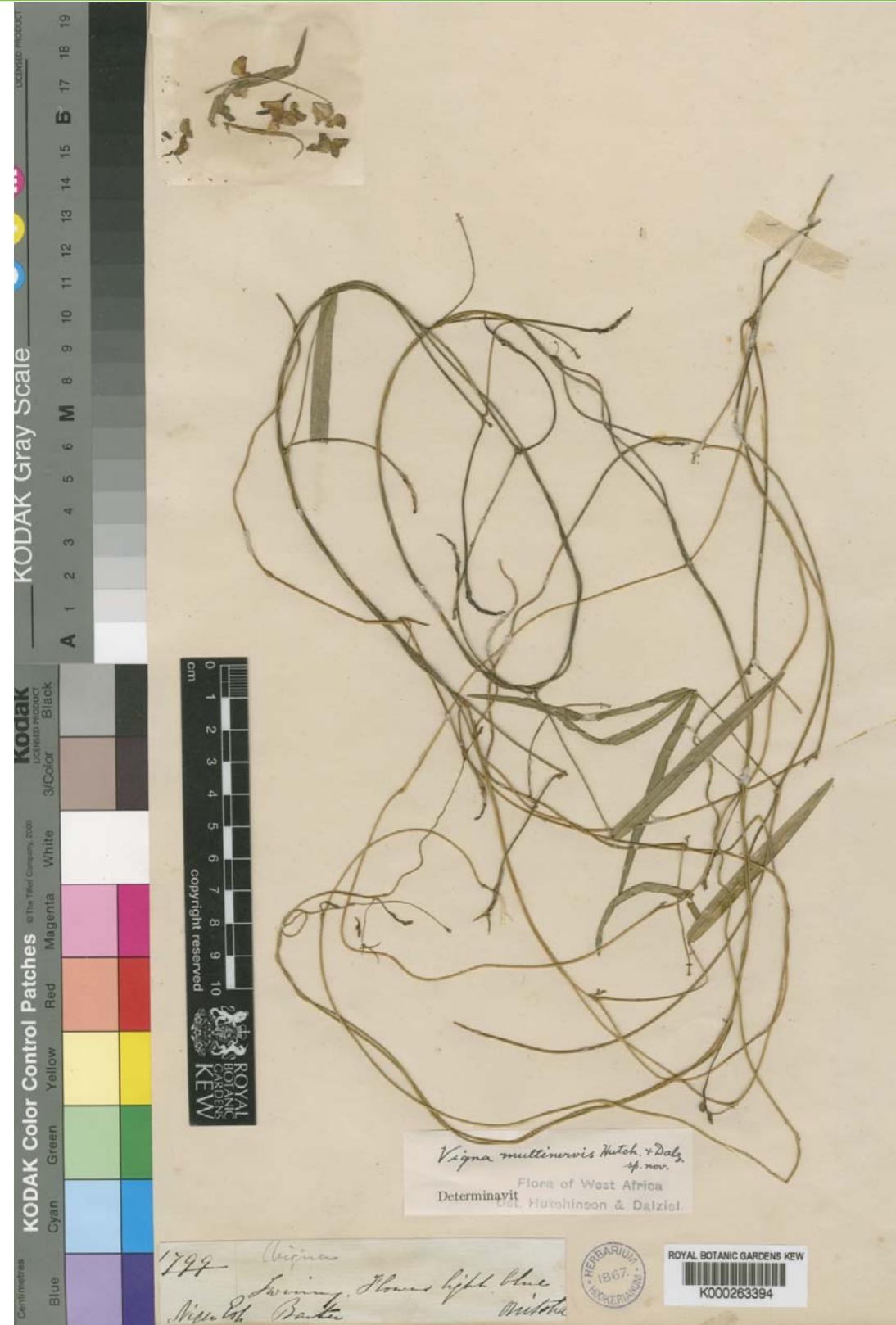
Without characteristic venation.



Reported from Sudan
but no localities known

All populations priority for
collection

References: Maxted et al. 2004, An ecogeographic study of African Vigna. FZ volume:3 part:5 (2001) Leguminosae by B. Mackinder, R. Pasquet, R. Polhill and B. Verdcourt



RBG Kew herbarium specimen



Up to 2m

LC
PRELIM



Highly variable

Highly variable

HABIT: Annual or perennial trailing or climbing herb, 0.6-1 m long. Stem densely covered with retrorse or spreading yellowish-brown hairs.

LEAVES: Leaflets 3, 1 on first nodes, 3-22 × 0.3-6 cm, ovate or elliptic to lanceolate or linear-oblong, rarely round, rounded to acuminate at the apex, rounded to subcordate at the base, petiole 1.5-8.5 cm long; rhachis 0.5-2.5 cm long; stipules 5-15 × 2-4 mm, ovate-lanceolate, multinerved, prolonged and cordate at the base. Peduncle 4-25 cm × 0.5-1.8 mm, as hairy as the stem, rhachis 0-2 mm long, 1-2-noded, internodes 1-2 mm long.

FLOWER: Pink to purple, 13-23 × 14-24 mm; pedicel 0.5-1.5 mm long, not expanding as the pod matures; bracteoles 5-12 × 1.5 mm, multinerved. Calyx with appressed or spreading bristly white or dark brown hairs; tube 3-6 mm long; lobes 7-20 mm long, linear-lanceolate, subequal, the upper pair joined for c. one-fifth to one-quarter of their length. Ovary 8-14 ovuled.

FRUIT: Pods 4-7 cm × 3-4.5 mm, linear-cylindrical, straight, appressed bristly pubescent to spreading hirsute with white or very dark brown hairs, with a curved beak.

SEEDS: 2.5-5 × 2-3.5 mm; hilum excentric, c. three-quarters the length of the seed, rim aril developed as two parallel lines.

Habitat:

Fallow fields, grasslands, forest edges, roadsides, savannah and open woodland areas, miombo woodlands, boggy ground, fallow and as a weed of cultivation; basaltic or laterite with sand, sandy loam or clay loam soils.

Altitude: 1 - 2800 m

Distribution:

Throughout Tropical Africa.

<i>Vigna reticulata</i>	May be confused with:

Reported from Sudan
but no localities known

All populations priority for
collection

References: Maxted et al. 2004, An ecogeographic study of African *Vigna*. FZ volume:3 part:5 (2001) Leguminosae by B. Mackinder, R. Pasquet, R. Polhill and B. Verdcourt



RBG Kew herbarium specimen

RBG Kew



Up to 1m



Sep - Dec and Apr - Jul

Sep - Dec and Apr - Jul 7

HABIT: Twining perennial herb, c. 2 m long from a large fibrous or woody rootstock. Stem velvety with dense appressed ferruginous hairs, becoming glabrescent.

LEAVES: Leaflets 3, 3-7 × 1.3-4.8 cm, narrowly ovate-oblong to ovate-lanceolate, less often ovate or ovate-elliptic, acute and mucronulate at the apex, rounded-subcordate at the base. Peduncle 3-18 cm × 1-2 mm, winged.

FLOWER: Yellow, 13-25 mm long; pedicel 2-8 mm long, expanding as the pod matures; bracteoles 1-3.5 × 0.5-0.8 mm, lanceolate or ovate, ciliolate, 1-nerved. Calyx finely appressed pubescent; tube 3-6 mm long; lobes 1.5 mm long, the lower twice as long as the laterals, the upper pair joined to form an acute or bifid lip. Standard 1.3-2.6 × 1.0-2.1 cm, longer than wide, obovate, with two small oblique appendages; keel slightly twisted towards the right or not twisted. Alternate anthers without a pair of glands at their base. Pollen exine not reticulate. Ovary 13-20-ovuled.

FRUIT: Pod 4-9.5 cm × 3.5-4 mm, linear-cylindrical, almost straight, velvety with closely appressed ferruginous hairs, beak narrow, very slightly curved or straight.

SEEDS: 2.5-4 × 1.5-3 × 1.5-2 mm; hilum 0.5-1 mm long, slightly excentric; rim-aril not developed or only slightly developed.

Habitat:

Grasslands, forest margin, thicket, degraded forests, savannah, roadsides, hills and mountain slopes.

Distribution:

Southern, Central and Eastern Africa.

Altitude: 70 - 4800 m

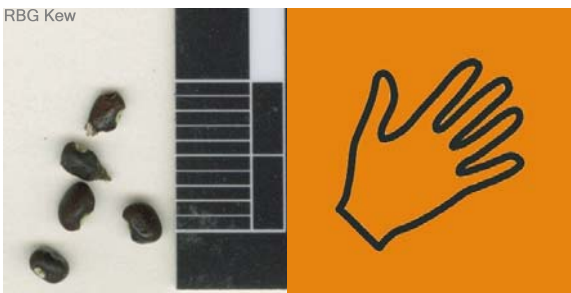
<i>Vigna schimperi</i>	May be confused with: <i>Vigna luteola</i>
Inflorescence subumbellate, pods held erect, cylindrical, 4-9.5 cm long, 3.5-4 mm wide.	Inflorescence axillary, few flowered, pods linear, 4-8 cm long, 5-6.5 mm wide.

Reported from Sudan
but no localities known

All populations priority for
collection



RBG Kew



2 m



Oct-Jan
and Apr-Jul

Oct-Jan
and Apr-Jul

HABIT: Perennial climbing or trailing herb, 0.3-6 m long, from a narrow woody rootstock. Stem sparsely to very densely covered with brown hairs or bristles.

LEAVES: Leaflets 3, 2.5-16.5 × 0.4-8.3 cm, ovate to lanceolate or in some variants elliptic to linear-oblong, acute or acuminate at the apex, rounded or truncate at the base, usually entire but rarely slightly lobed, nearly glabrous to pubescent to velvety on both surfaces; venation ± raised and reticulate on both surfaces, petiole 1.5-11 cm long, Peduncle 4.5-36 cm long; rhachis 0-1.5 cm long, 1-4-noded, internodes 2-6 mm long.

FLOWER: Pink to purple, rarely white tinged with mauve, 1.7-2.6 cm long; pedicel 1-2 mm long, not expanding as the pod matures; bracteoles linear-lanceolate, 1-nerved. Calyx with long brown or whitish bristly and also short white hairs, rarely glabrescent; tube 4-7 mm long; lobes subequal, the upper pair joined at the base only, keel twisted towards the right, asymmetrical, the beak incurved through 180°, the left-hand petal with a marked conical pocket 4-6 mm long.

FRUIT: Pods 8-14 cm × 3-5 mm, linear-cylindrical, scabrous, covered with short or long brown bristly hairs, with a straight beak.

SEEDS: Hilum slightly excentric; aril vestigial or not developed.

Habitat:

Grassland, savannah, swamp, lake shore, open bush, forest margin, woodland, river and roadsides, fallow and weed in cultivation; clay or sandy loam over sandstone or granite.

Distribution:

Widely distributed throughout Africa.

Altitude: 1 - 3900 m

<i>Vigna vexillata</i>	May be confused with:

Reported from Sudan
but no localities known

All populations priority for
collection



Reinaldo Aguilar

Reinaldo Aguilar



Reinaldo Aguilar

Reinaldo Aguilar

Tracy Slotta/USDA-NRCS PLANTS Database



0.3 - 6 m



Jan - Dec

Jan - Dec

HABIT: Annual, plants growing in tight groups. Culms robust, 40-90 cm tall, erect or geniculately ascending, often rooting at the lower nodes.

LEAVES: Mostly basal, leaf blades 5-35 cm × 3-6 mm, usually folded. Ligule with a definite ciliate fringe.

INFLORESCENCE: Racemose 3-17, 3.5-15.5 cm × 4-7 mm. Spikelets solitary, 4.6-7.8 mm long, elliptic, appressed, disarticulating.

GLUMES: Persistent, shorter than spikelets, the inferior 2-3.2(-3.9) mm long, the superior 3-4.7 mm long. Lemmas 3.7-4.9 mm long, lanceolate in profile, acute to subacute.

FRUIT: Caryopsis 1.2-1.6 mm long, oblong to broadly oblong, the surface uniformly granular and obliquely ridged.

Habitat:

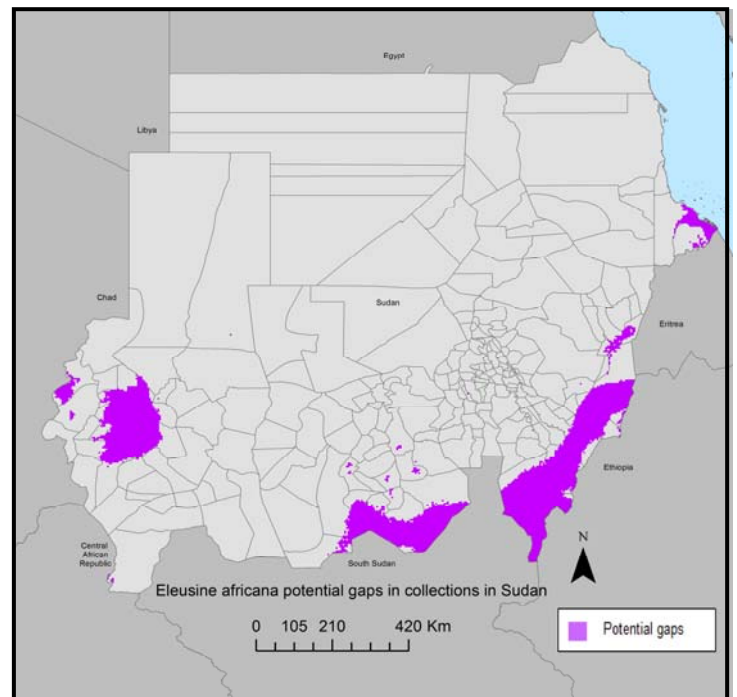
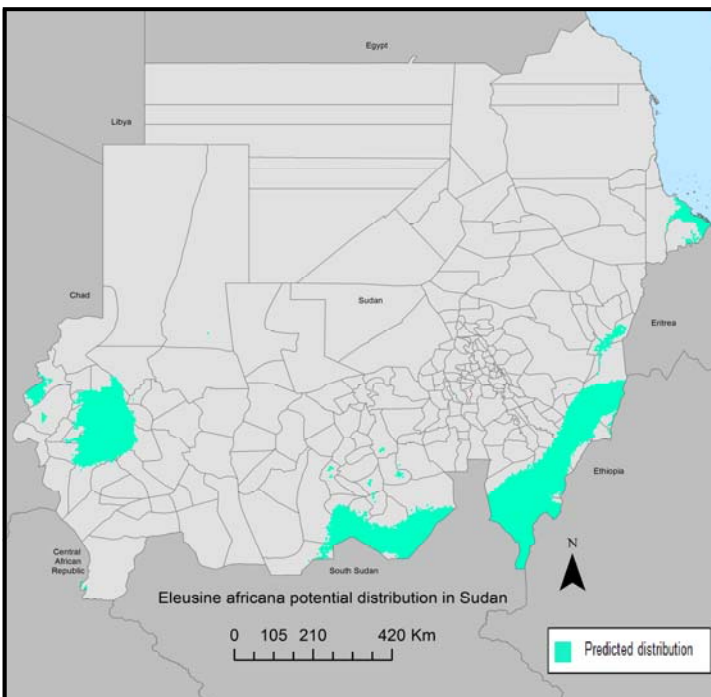
Usually in damp sandy soils beside rivers and dams, and in disturbed ground at roadsides; also in cultivated ground, often as a weed in crops, especially *E. coracana*.

Distribution:

Arabia and Africa, mainly in the uplands of the east and south.

Altitude: 500 - 2200 m

<i>Eleusine africana</i>	May be confused with: <i>Eleusine indica</i>
Larger spikelets (4.6-7.8 mm) and rounded grains.	Smaller spikelets (3-5 mm), oblong grains.



References: Phillips, S. (1995) Poaceae. In: Flora of Ethiopia and Eritrea. Volume 7, p 139; T. Cope (1999) Gramineae. In: Flora Zambesiaca, Volume 10, part 2; Hyde, M.A., Wursten, B.T. & Ballings, P. (2012). Flora of Zimbabwe.



RBG Kew



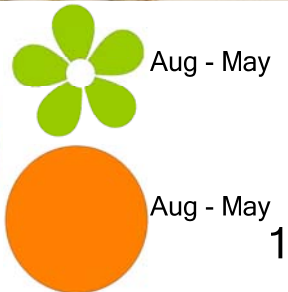
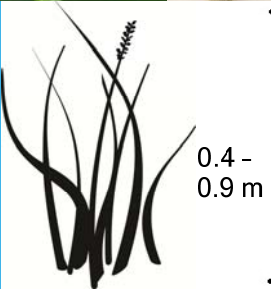
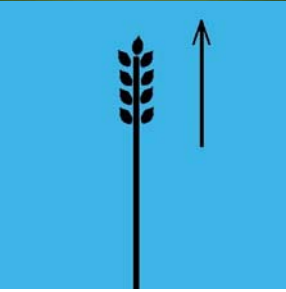
Petra Ballings



Petra Ballings



RBG Kew



Primary Gene Pool relative of *Eleusine coracana* (L.) Gaertn.

HABIT: Clump-forming annuals. Culms geniculately ascending, or decumbent, slender, 15-90 cm long.

LEAVES: Mostly basal. Leaf-sheaths keeled, outer margin hairy. Leaf-blades conduplicate, 5-35 cm long, 2.5-6 mm wide.

INFLORESCENCE: Racemes 1-10(-17), single (rarely), or digitate, unilateral, 3.5-15.5 cm long, 3-3.5 mm wide. Spikelets comprising 3-9 fertile florets, with diminished florets at the apex. Spikelets elliptic, laterally compressed, 3-5 mm long, breaking up at maturity.

GLUMES: Persistent, similar, shorter than spikelet. Fertile lemma lanceolate in profile, 2.1-3.6 mm long, membranous, 3-veined (excluding subsidiaries). Lodicules 2, cuneate, fleshy.

FRUIT: Caryopsis with free soft pericarp, ellipsoid, isodiametric, trigonous, concealed by floret, 1-1.3 mm long, black, striate.

Habitat:

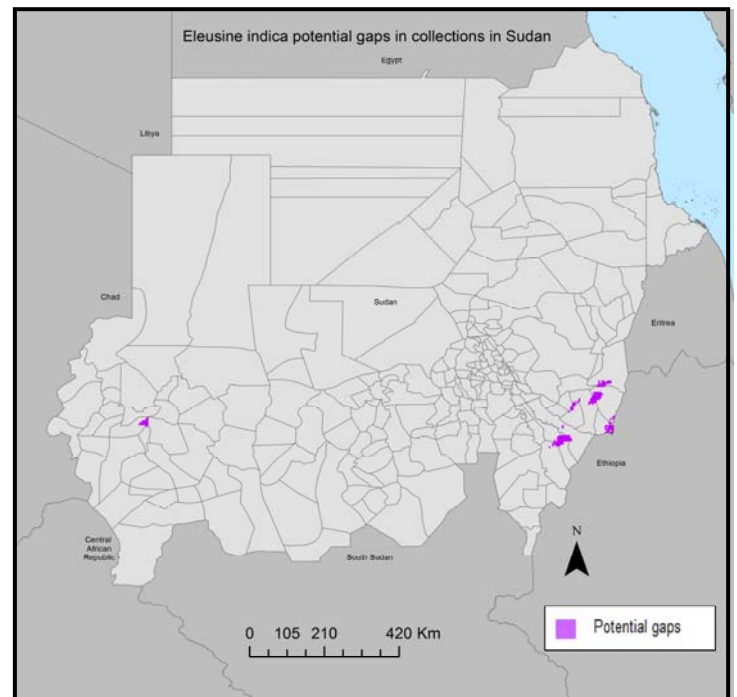
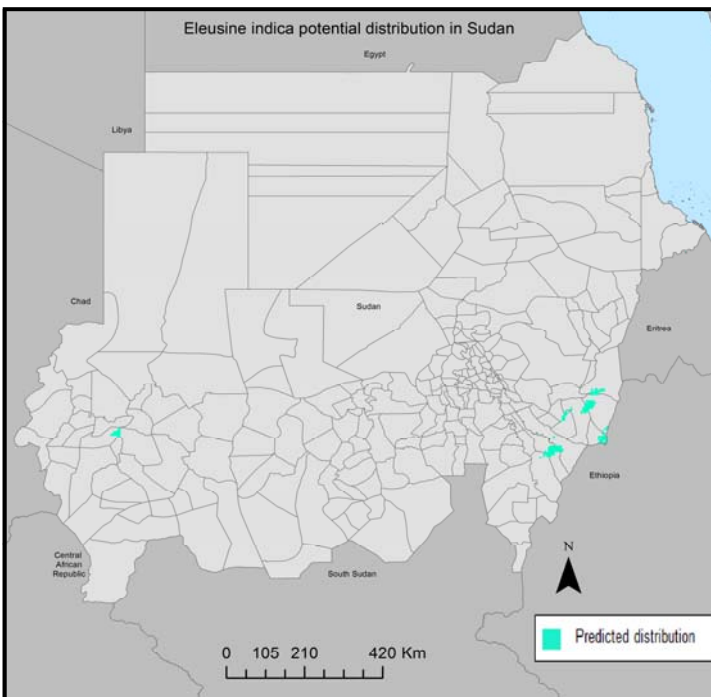
Found in moist as well as marshy areas, puddles, shallow ponds, fields, river and stream edges, ditches, canals etc.

Distribution:

Widespread throughout Africa, North and Central America, Southern Europe, Asia and Australasia.

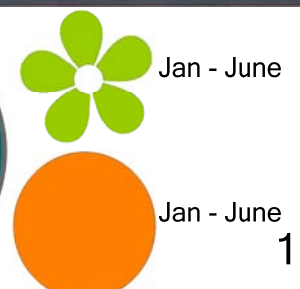
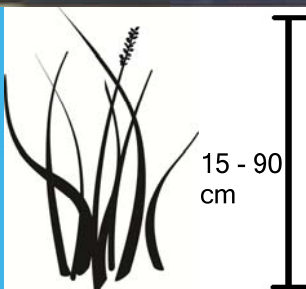
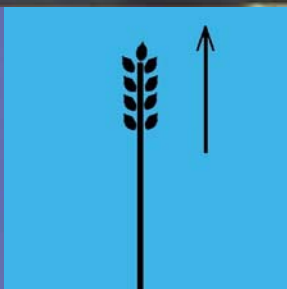
Altitude: 0 - 2000 m

<i>Eleusine indica</i>	May be confused with: <i>Eleusine africana</i>
Smaller spikelets (3-5mm), oblong grains.	Larger spikelets (4.6-7.8 mm) and rounded grains.



References: Juffe Bignoli, D. (2011) IUCN Conservation assessment: <http://www.iucnredlist.org/details/177359/0>; Clayton, W.D., Vorontsova, M.S., Harman, K.T. and Williamson, H. GrassBase - The Online World Grass Flora. <http://www.kew.org/data/grasses-db.html>.

Primary Gene Pool relative of *Eleusine coracana* (L.) Gaertn.



Primary Gene Pool relative of *Oryza glaberrima* and *Oryza sativa*

HABIT: Clump-forming annuals. Culms geniculately ascending, or decumbent; 60-120 cm long, spongy; 3-8 -noded, rooting from lower nodes.

LEAVES: Leaf-sheaths smooth, glabrous on surface, auricles erect. Ligule an eciliate membrane, 2-6 mm long, truncate, or obtuse. Leaf-blades 15-45 x 0.4-1.3 cm, surface scaberulous; rough adaxially, margins scabrous, apex acute.

INFLORESCENCE: Panicle open, obovate, 20-35 x 3-7.5 cm. Panicle branches angular, scaberulous, primary branches appressed or ascending. Spikelets solitary. Fertile spikelets pedicelled. Pedicels linear, angular; 1-6 mm long, smooth, or scaberulous, tip cupuliform, bibracteate. Spikelets comprising 2 basal sterile florets; and 1 fertile floret, without rhachilla extension. Spikelets oblong, laterally compressed, 7-11 x 2.5-3.4 mm, falling entire, callus glabrous, base truncate, attached obliquely.

GLUMES: Absent or obscure. Basal sterile florets similar, barren, without significant palea.

FLOWER: Lodicules 2, lanceolate, membranous. Anthers 6. Stigmas 2.

FRUIT: Caryopsis with adherent pericarp. Disseminule comprising a floret.

Habitat:

Found in Mopane or savanna woodland, savanna or fadama. Grows in deep water, seasonally flooded land, stagnant water and slowly flowing water or pools; prefers clay or black cotton soils. Found in open habitats.

Distribution:

Found throughout tropical Africa and as far south as Northern Botswana.

Altitude: 65 - 600 m

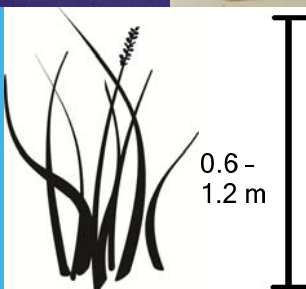
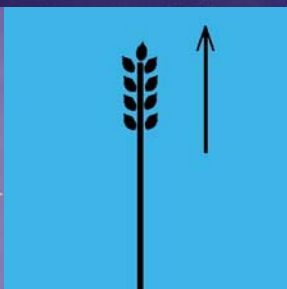
<i>Oryza barthii</i>	May be confused with: <i>Oryza longistaminata</i>
Leaves have short ligule (< 13mm).	Ligule of lower leaves > 15mm.

Reported from Sudan
but no localities known

All populations priority for
collection

References: Vaughan, D.A. (1994) The Wild Relatives of Rice: A Genetic Resources Handbook.

Primary Gene Pool relative of *Oryza glaberrima* and *Oryza sativa*



Gene Pool Secondary relative of *Oryza glaberrima* Steud.

HABIT: Annual or weakly perennial, 0.6 m, tufted grass, with slender culms, growing in clumps, rooting from lower nodes.
LEAVES: Leaf-sheaths smooth, glabrous on surface, auricles falcate. Ligule an eciliate membrane, 1-2 mm long, entire, or lacerate, truncate. Leaf-blades 7-19 cm long, 1-5 mm wide, surface smooth or scaberulous, rough adaxially, margins scaberulous, apex acute.

INFLORESCENCE: A panicle. Panicle compact, open, ovate, 13-30 cm long, 2.5-5 cm wide. Primary panicle branches appressed, or ascending. Panicle branches angular, smooth, or scaberulous. Spikelets solitary, small and slender, 7.7-10 mm long and 1.4-1.8 mm wide, with long white awns (6-17 cm long). Fertile spikelets pedicelled. Pedicels linear, angular, 1.5-2.5 mm long, scaberulous, tip cupuliform. Fertile spikelets comprising 2 basal sterile florets, 1 fertile florets, without rhachilla extension. Spikelets oblong, laterally compressed, 6.5-9.25 mm long, 1.25-1.5 mm wide, falling entire. Spikelet callus glabrous, base truncate, attached obliquely.

GLUMES: Both absent or obscure.

FLOWER: Lodicules 2, lanceolate, membranous. Anthers 6, 2-3.4 mm long. Stigmas 2.

FRUIT: Caryopsis with adherent pericarp, ellipsoid, 4-4.75 mm long, dark brown. Disseminule comprising a floret. Fruit blackish when mature.

Habitat:

Shallow water, flat iron stone rocks, open sites, laterite rock pools, granite/lateritic outcrops, in ponds, near streams.

Distribution:

Burkina Faso, Cameroon, Central African Republic, Chad, Democratic Republic of Congo, Guinea, Mali, Niger, Senegal, Sierra Leone, Sudan, Tanzania, and Zambia.

Altitude: 60 - 600 m

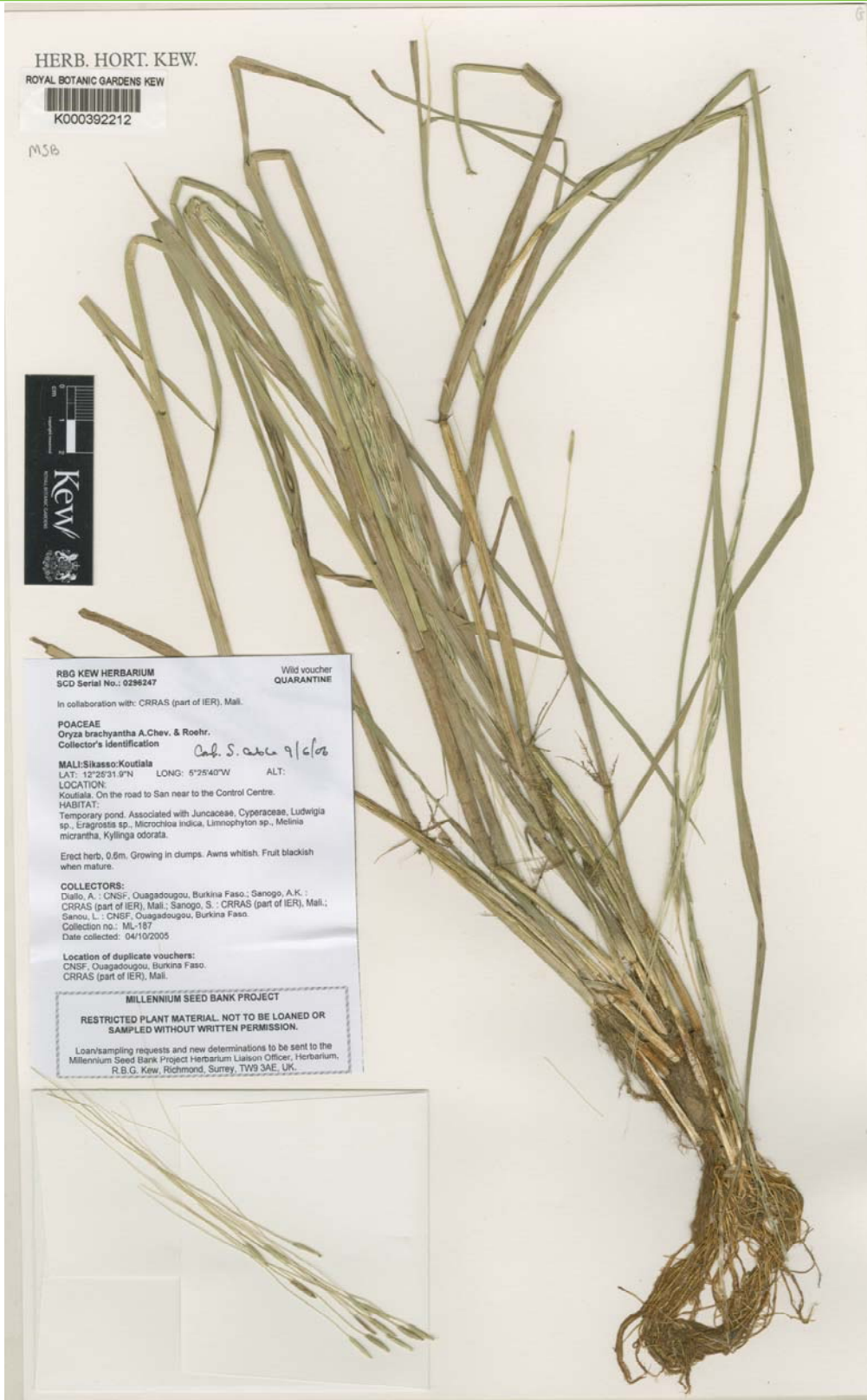
<i>Oryza brachyantha</i>	May be confused with: <i>Other Oryza species</i>
Flowering glumes showing an almost smooth surface with minute, longitudinal dotted stripes and awl or bristle shaped upper empty glumes.	

Reported from Sudan
but no localities known

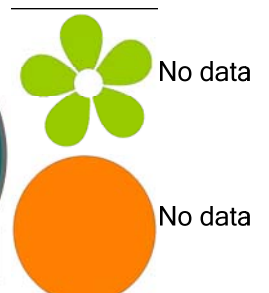
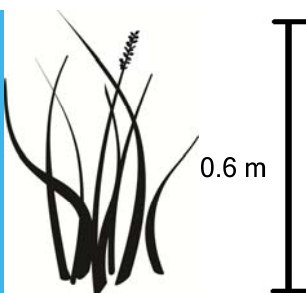
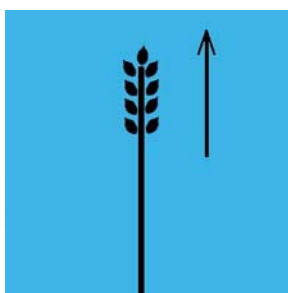
All populations priority for
collection

References: Clayton, W.D., Vorontsova, M.S., Harman, K.T. and Williamson, H. (2006 onwards). GrassBase - The Online World Grass Flora. <http://www.kew.org/data/grasses-db.html>. [accessed 08 November 2006; 15:30 GMT]; Wild Rice Taxonomy (www.knowledgebank.irri.org)

Gene Pool Secondary relative of *Oryza glaberrima* Steud.



Peterson W. Wambugu



Primary Gene Pool relative of *Oryza glaberrima* and *Oryza sativa*

HABIT: Rhizomes elongated. Culms geniculately ascending, or decumbent, 70-120 x 0.5-1 cm.

LEAVES: Leaf-sheaths smooth, glabrous on surface. Ligule an eciliate membrane, Leaf-blades 10-75 x 0.5-2.5 cm.

INFLORESCENCE: Panicle open, elliptic, or oblong, 16-40 cm long, 1.5-8 cm wide. Primary panicle branches appressed, or ascending. Panicle branches angular; scaberulous, glabrous or pubescent in axils. Spikelets solitary. Fertile spikelets pedicelled, comprising 2 basal sterile florets and 1 fertile floret without rhachilla extension. Spikelets oblong, laterally compressed, 7-12 x 2-3 mm, falling entire. Spikelet callus glabrous, base truncate, attached obliquely.

GLUMES: Absent or obscure. Basal sterile florets similar, barren, without significant palea. Lodicules 2, lanceolate, membranous.

FLOWER: Anthers 6, 4.5-5.5 mm long. Stigmas 2.

FRUIT: Caryopsis lanceolate or oblong, 5-7 mm long, laterally compressed, reddish, hilum linear, as long as caryopsis.

Habitat:

Deep water, standing or running water, salt marshes, dry, sandy fields.

Distribution:

Throughout Africa.

Altitude: 0 - 2000 m

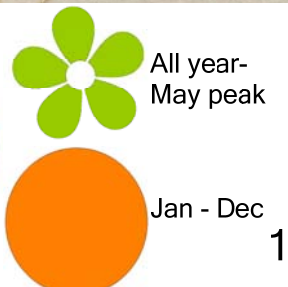
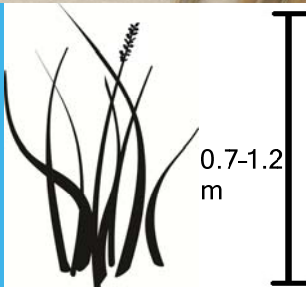
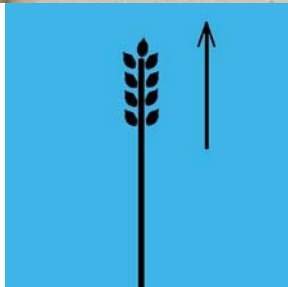
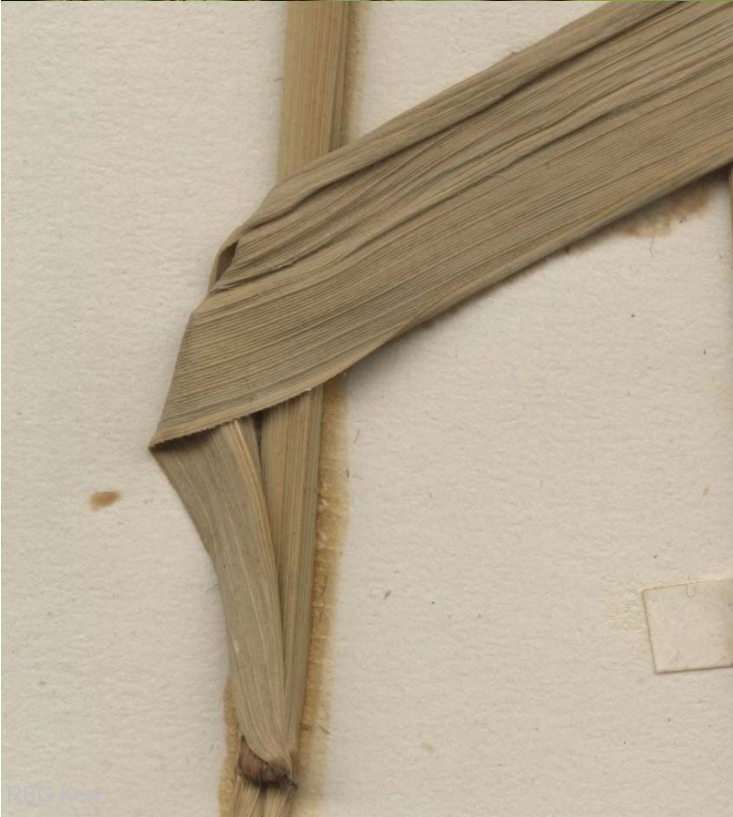
<i>Oryza longistaminata</i>	May be confused with: <i>Oryza sativa</i>
Red caryopsis.	Caryopsis brown to white.

Reported from Sudan
but no localities known

All populations priority for
collection

References: Flora of Mozambique website: <http://www.mozambiqueflora.com>; IRRI Rice Knowledge Bank <http://www.knowledgebank.irri.org>

Primary Gene Pool relative of *Oryza glaberrima* and *Oryza sativa*



HABIT: Clump-forming annuals. Culms 50-120(-150) cm long, 3-6 mm diameter, spongy, 3-5-noded.
LEAVES: Leaf-sheaths smooth, glabrous on surface. Leaf-blade surface scaberulous, rough on both sides, margins scabrous, apex acuminate.
INFLORESCENCE: Panicle open, elliptic; 15-35 x 3-17 cm. Primary panicle branches ascending, or spreading. Panicle branches angular; scaberulous. Spikelets solitary. Fertile spikelets pedicelled. Pedicels linear, angular; 2-5 mm long, scaberulous, tip cupuliform. Fertile spikelets comprising 2 basal sterile florets and 1 fertile floret, without rhachilla extension. Spikelets elliptic, laterally compressed, 4.9-6.2 mm long, 1.9-2.6 mm wide (2.5 times longer than wide), falling entire. Spikelet callus glabrous, base truncate, attached transversely.
GLUMES: Absent or obscure. Basal sterile florets similar, barren, without significant palea.
FRUIT: Caryopsis with adherent pericarp. Disseminule comprising a floret.

Habitat:

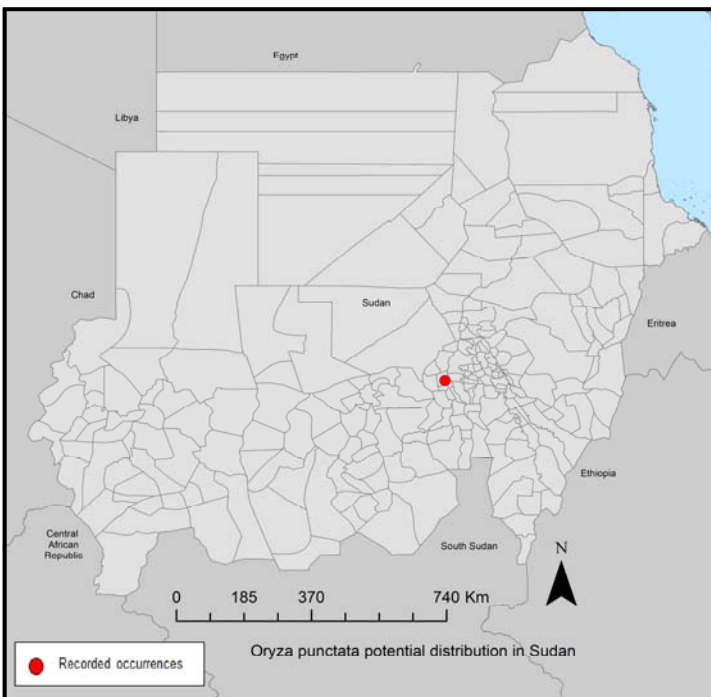
Open/semi-open habitats, forest margins, grassland and thickets, degraded mopane scrub, open bush or shifting cultivation fields; swampy areas, around water holes and pools, on riverbanks that flood to 1 m. Prefers black clay or sandy soil.

Altitude: 33 - 930 m

Distribution:

Distributed across southern, eastern, central and western Africa.

<i>Oryza punctata</i>	May be confused with: <i>Oryza eichingeri</i>
Culms 3-6 mm diameter.	Culms 2-3 mm diameter.



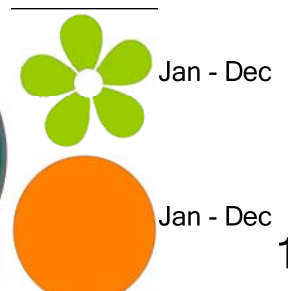
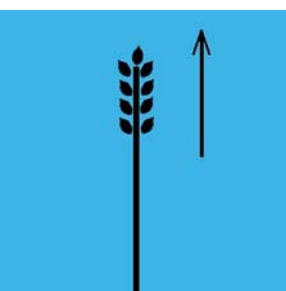
All populations priority for collection

References: Clayton, W.D., Vorontsova, M.S., Harman, K.T. and Williamson, H. (2006 onwards). GrassBase - The Online World Grass Flora. <http://www.kew.org/data/grasses-db.html>; IRRI rice knowledgebank <http://www.knowledgebank.irri.org/extension/oryza-punctata-kotschy-ex-steud.html>



RBG Kew

Gemma Toothill, (c) Board of Trustees RBG Kew



HABIT: Height less than 1 m, it does not possess an involucre stalk.

INFLORESCENCE: Shorter than 15 cm, fertile lemma length of more than 5 mm.

SEED: Small (less than 1 mm deep), elliptical seed shape.

Habitat:

Dry stream beds, roadsides, abandoned fields, human habitations.

Distribution:

Burkina Faso, Cameroon, England, India, Mali, Mauritiana, Niger, Nigeria, Sudan, Senegal, Chad, United States of America, Zimbabwe.

Altitude: unknown

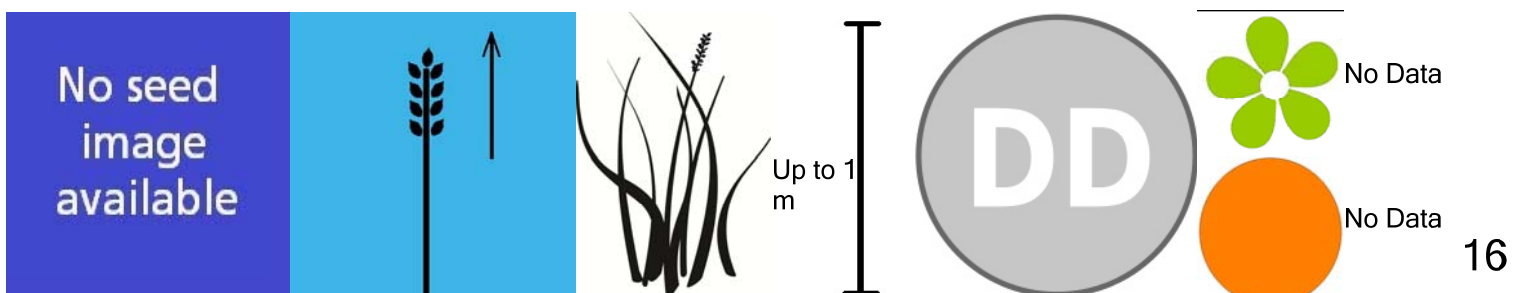
<i>Pennisetum glaucum subsp. monodii</i>	May be confused with:

Reported from Sudan
but no localities known

All populations priority for
collection

NO IMAGE AVAILABLE

If you know of an image or link to an image of this species please let us know cropwildrelatives@kew.org



Gene Pool Primary relative of *Pennisetum glaucum* (L.) R. Br.

HABIT: Annual. Culms erect or slightly geniculate, moderately stout, up to 1.2 m. or more high, up to 6-noded, simple or branched from the upper nodes, terete or grooved on the side facing a branch, pubescent towards the inflorescence and with a ring of dense hairs below the upper or all the nodes, otherwise glabrous and smooth.

LEAVES: Leaf-sheaths shorter than the internodes, terete, striate, sparingly hirsute with tubercle-based hairs towards the blade or glabrous and smooth; ligule reduced to a densely ciliate rim with hairs up to 5 cm long; blade linear, contracted at the base, tapering to a fine acute tip, up to 30 cm or more long and 15 cm wide, flat, firm, sparingly hirsute with long spreading hairs or glabrous, scaberulous on both surfaces or smooth below, scabrid on the margins.

INFLORESCENCE: Spikelets solitary, rarely paired, minutely pedicelled within the involucre, oblong or ovate-oblong, slightly gibbous, 5.7-7.6 cm long. Lower glume very minute and similar to the upper or suppressed; upper oblate or oblong, obtuse or truncate.

FLOWER: Lodicules 0. Anthers 3.8 cm long, with penicillate tips. Styles connate. Grain obovoid, 3.8 cm long, slightly exposed between the gaping valve and valvule.

Habitat:

Usually found in proximity to the cultivated species.

Distribution:

Burkina Faso, Nigeria, Tanzania, Senegal

Altitude: 200 - 500 m

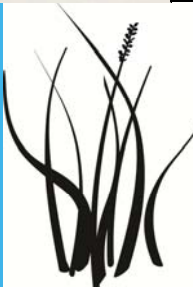
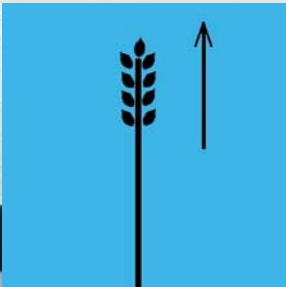
<i>Pennisetum stenostachyum</i>	May be confused with: <i>Pennisetum glaucum</i>
Spikelets readily deciduous at maturity.	Spikelets persistent at maturity.

Reported from Sudan
but no localities known

All populations priority for
collection

References: <http://plants.jstor.org/stable/10.5555/al.ap.flora.flota016481>

Gene Pool Primary relative of *Pennisetum glaucum* (L.) R. Br.



Up to 1.2 m



No Data

No Data

HABIT: Annual, or short lived perennial without rhizomes; culms 0.3-4 m high, often robust, the nodes glabrous or pubescent.

LEAVES: Leaf blades variable. often large, 5-75 cm long, 5-70 mm wide.

INFLORESCENCE: Panicle linear to broadly spreading, 10-60 cm long; primary branches compound, ultimately bearing racemes of 2-7 spikelet pairs. Sessile spikelet sometimes tomentose or fulvously pubescent, awnless or more often with an awn 5-30 mm long. Pedicelled spikelet linear to lanceolate, male or barren, smaller than the sessile.

Habitat:

Swampy soils, streamsides and black clays; also in disturbed places and old farmland.

Distribution:

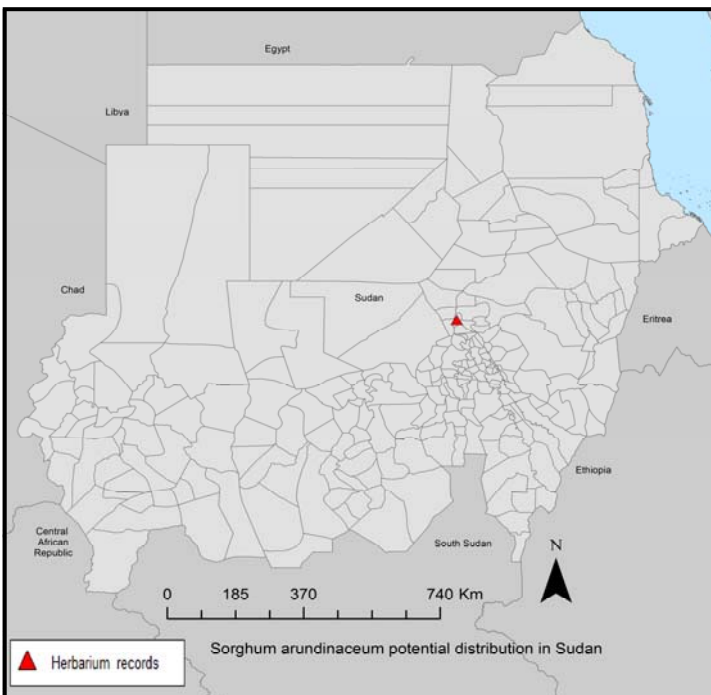
Found throughout Africa.

Altitude: 0 - 1800 m

Sorghum arundinaceum

May be confused with:
Other African Sorghum species

Nodes glabrous or pubescent,
racemes fragile.

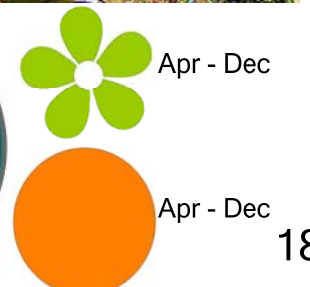
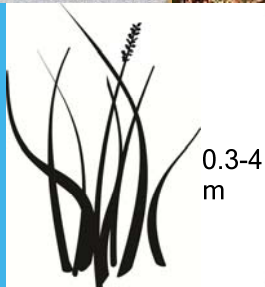
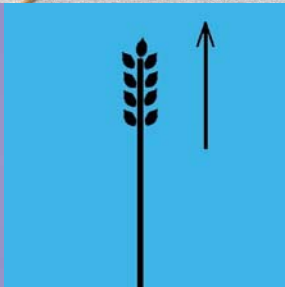


All populations priority for
collection

References: Calyton & Renvoize, 1982, FTEA, Graminae (Part 3).



Tracey Slotta @ USDA-NRCS PLANTS Database



HABIT: Annual, rarely short-lived perennial, culms 30–400 cm high, robust, branched.

LEAVES: Leaf sheaths glabrous, ligule a membrane, edged with a fringe of fine hairs and hairy on the back, leaf laminas often large, 5–75 × 0.5–0.7 cm, broadly lanceolate, flat, glabrous on both surfaces, with a prominent whitish midrib.

INFLORESCENCE: Panicle 10–60 cm long, broadly spreading, main axis angular, glabrous, primary branches divided, pubescent at the nodes, 2–7-jointed, rachis internodes and pedicels pilose. Sessile spikelet (4–)7(–9) mm long, lanceolate to narrowly ovate.

GLUMES: Coriaceous, inferior glume dorsally compressed, narrowly ovate, 2-keeled on the margins, superior glume glabrescent or with sparse hairs on the back, inferior floret empty, its lemma c. 5.5 mm long, lanceolate, ciliate on the margins, superior floret bisexual, its lemma c. 3 mm long, deeply lobed, ciliate on the lobes and margins, 1-awned, glabrous. Palea c. 2 mm long. Pedicelled spikelets neuter, c. 6.5 mm long, linear to lanceolate, glumes chartaceous, inferior glume glabrous, superior glume slightly shorter than the inferior, glabrous, inferior lemma glabrous, with a truncate apex.

Habitat:

Swampy soils, streamsides, disturbed places and old farmland.

Distribution:

Native to Africa, Madagascar, and perhaps to the Mascarenes. Introduced to India, Australia, and the Americas.

Altitude: 50 - 1400 m

Sorghum bicolor subsp. verticilliflorum

May be confused with:
Sorghum bicolor subsp. drumondii

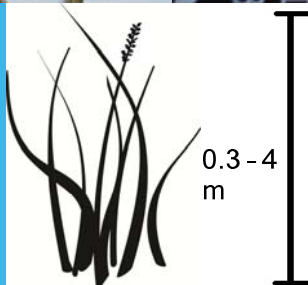
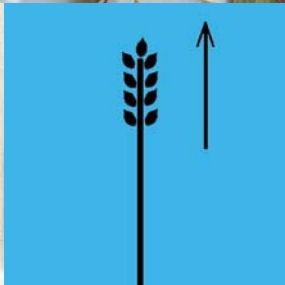
Leaf blades linear lanceolate, up to 75 x 7 cm, panicle up to 60 cm long x 25 cm wide.

Leaf blades lanceolate 50 x 6 cm, panicles 30 cm long x 15 cm wide.



All populations priority for collection

References: Clayton, W.D., Vorontsova, M.S., Harman, K.T. and Williamson, H. (2006 onwards). GrassBase - The Online World Grass Flora. <http://www.kew.org/data/grasses-db.html>.



Tertiary Gene Pool relative of *Sorghum bicolor*

HABIT: Annual, culms 30-150 cm high, erect with bearded nodes.

LEAVES: Leaves cauline. Leaf blades 10-50 x 0.2-1 cm. Ligule a ciliate membrane, pilose on abaxial surface.

INFLORESCENCES: Open, oblong panicles, whorled at most nodes, bearing racemes of 3-5 spikelet pairs, 5-35 cm long. Rhachis fragile at the nodes, ciliate on margins, with red or white hairs 2-3 mm long. Internodes filiform, 5 mm long, tip transverse and cupuliform. Spikelets paired. Pedicels filiform, ciliate. Fertile spikelets sessile, 1 per cluster, lanceolate, dorsally compressed, 7.5-10 mm long, falling entire, deciduous with accessory branch structures, callus bearded, base obtuse, callus hairs white, or red. Companion sterile spikelets pedicelled, 1 per cluster, well-developed, male, linear to lanceolate, 6-10 mm long, shorter than fertile and separately deciduous, glumes chartaceous, muticous, lemmas enclosed by glumes.

GLUMES: Dissimilar, lower wider than upper, exceeding apex of florets, shiny. Lemma margins ciliate, apex dentate, 2-fid, 1-awned. Principal lemma awn from a sinus, geniculate, 20-40 mm long, with twisted column. Column of lemma awn pubescent; hairy on the spiral. Palea absent or minute.

Habitat:

Riverine or lakeside alluvial soils and on black clays.

Distribution:

Middle and Eastern Africa, and Southcentral Asia.

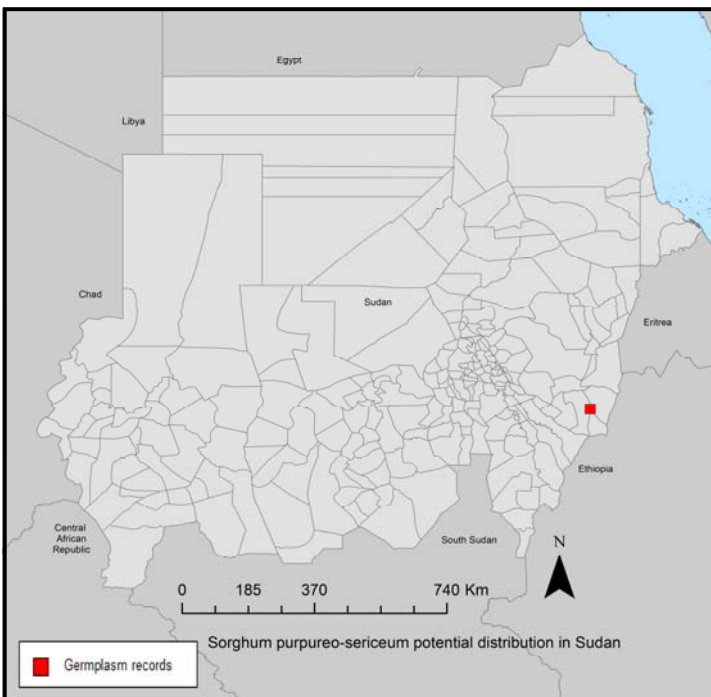
Altitude: 500 - 1500 m

Sorghum purpureosericeum

May be confused with:
Sorghum versicolor

Sessile spikelet 8-10 mm long, lanceolate; pedicelled spikelet 6-10 mm long.

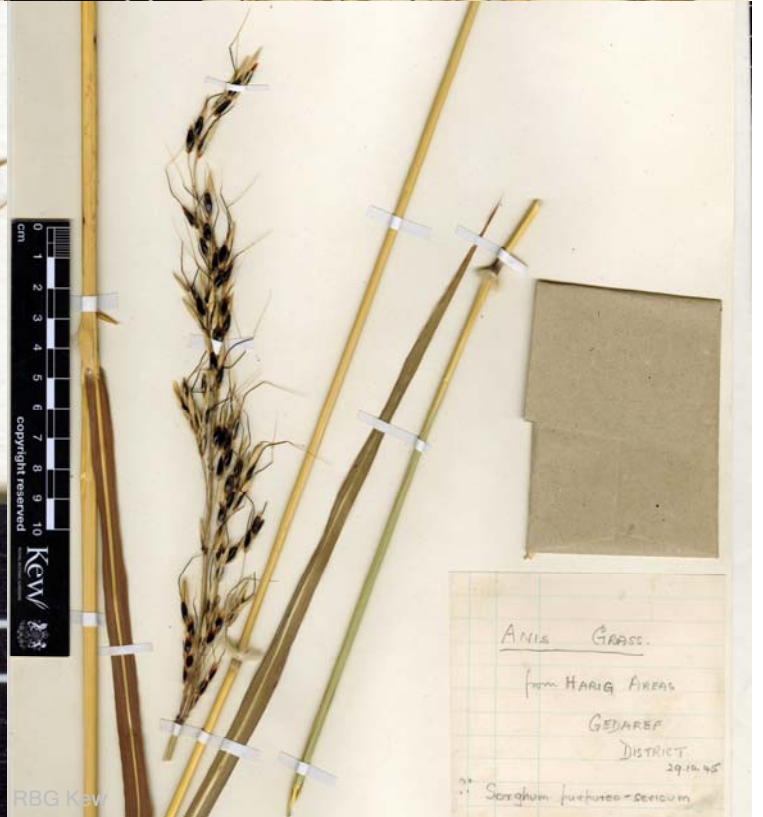
Sessile spikelet 5-7 mm long, elliptic-oblong; pedicelled spikelet 3-5 mm long.



All populations priority for collection

References: Phillips, S. (1995) Poaceae. In: Flora of Ethiopia and Eritrea Volume 7 p 301; Clayton & Renvoize (1982) Flora of Tropical East Africa Graminae (Part 3).

Tertiary Gene Pool relative of *Sorghum bicolor*



(c) Board of Trustees RBG Kew

Summary graphic for *Sorghum purpureosericeum* including seed images (2 mm scale), a stylized plant icon with an upward arrow, a silhouette of the plant with a height scale of 0.3-1.5 m, a green circle with 'LC', and a green flower icon with 'Jan - Dec' and an orange circle with 'Jan - Dec'.

Confirmed use in breeding for *Sorghum bicolor* (L.) Moench

Tunis grass

HABIT: Annual. Culms erect; 50-100 cm long. Culm-nodes glabrous, or pubescent.**LEAVES:** Cauline. Ligule a ciliolate membrane; 2 mm long. Leaf-blades 15-45 cm long; 4-8 mm wide.**INFLORESCENCE:** A panicle with branches tipped by a raceme. Panicle open; lanceolate; 15-60 cm long. Racemes 1-4 cm long; bearing 3-7 fertile spikelets on each. Rhachis fragile at the nodes; ciliate on margins. Rhachis internodes filiform. Rhachis internode tip transverse; cupuliform. Spikelets appressed; in pairs. Fertile spikelets sessile; 1 in the cluster. Companion sterile spikelets pedicelled; 1 in the cluster. Pedicels filiform; flattened; ciliate.**FLOWER:** Lodicules 2; oblong; fleshy. Anthers 3. Stigmas 2.**FRUIT:** Caryopsis with adherent pericarp. Hilum punctiform. Endosperm farinose. Disseminule comprising a rhachis internode.**Habitat:**

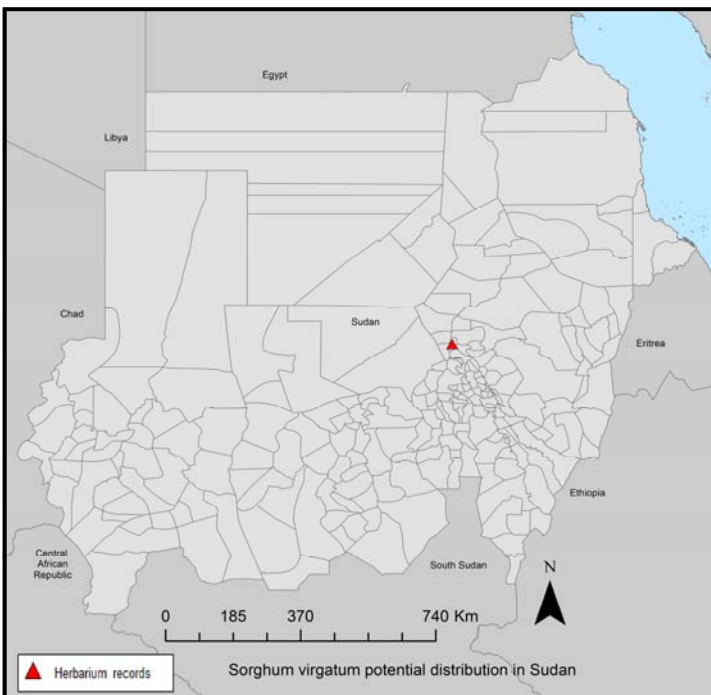
Clay soil, frequent in sandy soil, marsh, in grasslands, terrestrial.

Distribution:

Africa (Egypt, Senegal, Mauritania, Niger, Chad, Ethiopia, Sudan), Asia (Palestine, Jordan, Sinai Peninsula) and Saudi Arabia.

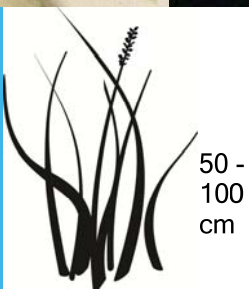
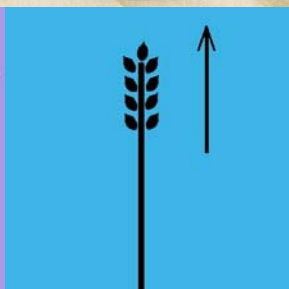
Altitude: 1158 - 1219 m

<i>Sorghum virgatum</i>	May be confused with:



All populations priority for collection

References: Clayton, W.D., Vorontsova, M.S., Harman, K.T. and Williamson, H. (2006 onwards). GrassBase - The Online World Grass Flora. <http://www.kew.org/data/grasses-db.html>. [accessed 08 November 2006; 15:30 GMT]



Secondary Gene Pool relative of Eggplant - *Solanum melongena* L.

HABIT: Erect shrub up to 1.5 m, prickly or unarmed. Young stems erect, robust, moderately to densely stellate-pubescent and prickly or unarmed, with porrect, sessile or variously stalked trichomes; bark of older stems moderately stellate-pubescent, green-brown to red-brown.

LEAVES: Entire, sometimes lobed, the blades 3.5-17(-40) cm long, 0.6-10(-19) cm wide, 1.5-4 times longer than wide, ovate to elliptic or lanceolate, chartaceous, moderately to densely stellate-pubescent on both surfaces, with porrect, sessile or stalked trichomes.

INFLORESCENCE: Terminal or lateral, 2-11 cm long and the plants andromonoecious, with 1-3(5) long-styled flowers at the base of the inflorescence.

FLOWER: Flowers (4-)5(-6)-merous, heterostylous. Calyx 7-15 mm long in long-styled flowers, 5-10 mm long in short-styled flowers. Corolla 2.5-4.5 cm in diameter in long-styled flowers, 1.8-4 cm in diameter in short-styled flowers, pale mauve to dark mauve, stellate.

FRUIT: A spherical berry, 1-2(-4) per infructescence, 1.5-3 cm in diameter, the pericarp smooth, dark green with pale green and cream markings when young, yellow at maturity; fruiting pedicels woody, pendulous, with 0-10 prickles.

SEEDS: ca. 30-150 per berry, 2.7-3.2 mm long, 1.9-2.6 mm wide, flattened-reniform, dull yellow to orange-brown.

Habitat:

Roadsides, abandoned cultivation, savanna, bushland, dunes, forest edges.

Distribution:

Found throughout Eastern Africa and distributed as far north as Sudan.

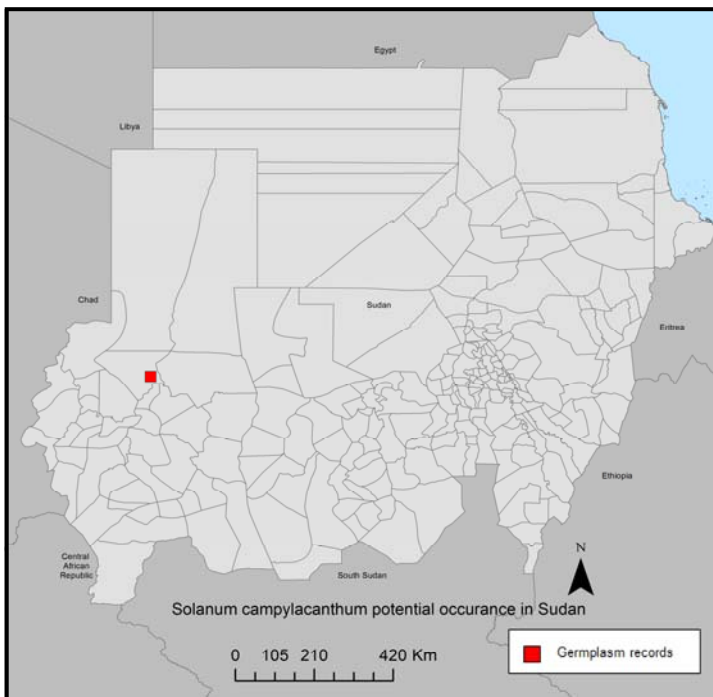
Altitude: 0 - 2300 m

Solanum campylacanthum

Extremely widespread and variable, recognised by mauve flowers, big bright yellow fruits, a long taproot, and leaves that are usually big (up to 17 cm long) and entire.

May be confused with:
Other prickly Solanums

Other *Solanums* in this area do not have this combination of characters.



All populations priority for collection

References: Vorontsova, M. & Knapp, S. *Solanum campylacanthum*. In *Solanaceae Source*. <http://solanaceaesource.org/content/solanum-campylacanthum> [Downloaded 18th April 2013.]

Secondary Gene Pool relative of Eggplant - *Solanum melongena* L.



0.2-1.5 m



Jan - Dec

Jan - Dec

HABIT: Erect shrub, 0.5-1.5 m, prickly. Young stems erect, slender.

LEAVES: Lobed, the blades 6-17 cm long, 4-14 cm wide, 1.5-2.5 times longer than wide, ovate to elliptic, membranous to chartaceous.

INFLORESCENCES: Terminal or lateral, 3-7 cm long, rarely branched, with 4-10 flowers, 1-4 flowers open at any one time.

FLOWER: Flowers 5-merous, heterostylous and the plants andromonoecious, with the lowermost flower long-styled and hermaphrodite, the distal flowers short-styled and staminate. Corolla 2.4-3 cm in diameter in long-styled flowers, 1.8-2.5 cm in diameter in short-styled flowers, white to mauve, stellate, lobed for 1/3-1/2 of its length.

FRUIT: A spherical berry, 1-3 per infructescence, ca. 3.5 cm in diameter, the pericarp smooth, dark green with pale green and cream markings when young, yellow at maturity; fruiting pedicels ca. 2.5 cm long, 1.5-2 mm at base, woody, pendulous, with 0-10 prickles; fruiting calyx not accrescent, covering ca. 1/6 of fruit, reflexed, with 0-20 prickles.

SEEDS: ca. 100-200 per berry, 2.4-2.6 mm long, 1.8-2 mm wide, flattened-reniform, orange-brown.

Habitat:

Fallow land, scrubland, and woodland.

Distribution:

From Senegal to Cameroon, Sudan and Ethiopia.

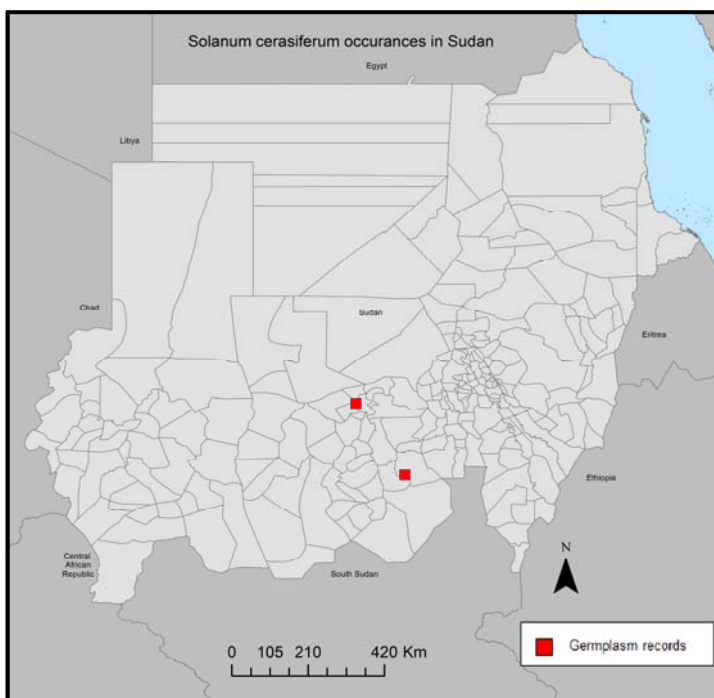
Altitude: 450 - 1200 m

Solanum cerasiferum

short-attenuate leaf bases and deltate to long-deltate membranous calyx lobes 4-7 mm long with only 0-20 prickles on long-styled flowers.

May be confused with:
Solanum umtuma

Cuneate to truncate leaf bases and ovate foliaceous calyx lobes 7-10 mm long with between 30-80 prickles at anthesis on long-styled flowers.



All populations priority for collection

References: Vorontsova, M. & Knapp, S. *Solanum cerasiferum*. In Solanaceae Source <http://solanaceaesource.org/content/solanum-cerasiferum> [Downloaded 09/06/14]



Gene Pool Tertiary relative of *Solanum melongena* L.

HABIT: Perennial herbs to subshrubs, 10-70 cm, usually armed, often with several stems. Young stems erect, ribbed, becoming terete with age, densely stellate-pubescent.

INFLORESCENCE: Lateral, 2-3 cm long, unbranched, with 1-6(10) flowers; peduncle 0-0.5 cm; rachis 0-0.8(3.8) cm; peduncle and rachis densely pubescent.

FLOWER: Apparently all perfect, 5-merous. Calyx widely cupular to obconical, divided for 1/2-2/3(3/4) of its length, the tube 2-4 mm long, the lobes equal or unequal, narrow-deltoid, apically acute to caudate, 4-6.5 x 1.8-2.5 mm, tearing unevenly, the central tissue chartaceous, with a dark raised midvein. Corolla 1.5-2.3 cm in diameter, blue-violet, rotate, lobed for ca. 2/3 of its length. Stamens free; filament tube ca. 1.5 mm.

FRUIT: A globose berry, 2-8 per infructescence, 0.7-1.3 cm in diameter, the pericarp ca. 0.15 mm thick, hard, shiny, bright yellow to orange, yellow at maturity, with venation visible on the inner surface, fruiting calyx accrescent, the calyx tube expanding ahead of the developing fruit, enclosing almost all pericarp.

SEEDS: 2.3-2.8 x 1.7-2.5 x ca. 0.7 mm, asymmetrical, rounded-reniform, somewhat variable in outline, thickened towards the center, shiny, dark red-brown, appearing intense black, the surface smooth, with fine raised outlines of cells or small pits.

Habitat:

Cultivated land, grazed ground, roadsides, coastal plains, and savannah; usually on sand, silt or loam.

Distribution:

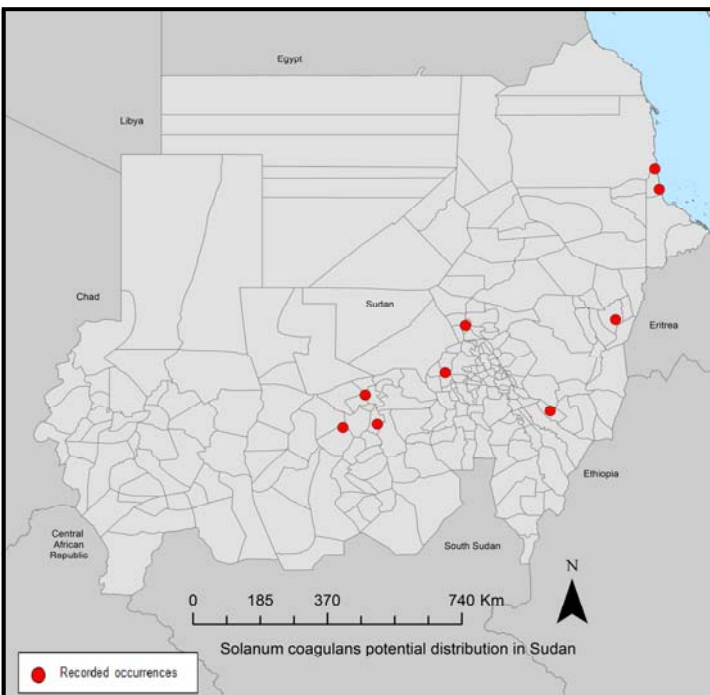
Northeast Africa and the Arabian Peninsula.

Altitude: 0 - 1700 m

Solanum coagulans

May be confused with:
Other African Solanums

Distinguished by densely spiny accrescent calyx covering most of the pericarp.



All populations priority for collection

References:

Gene Pool Tertiary relative of *Solanum melongena* L.



Credit: Maria Vorontsova / RBG Kew



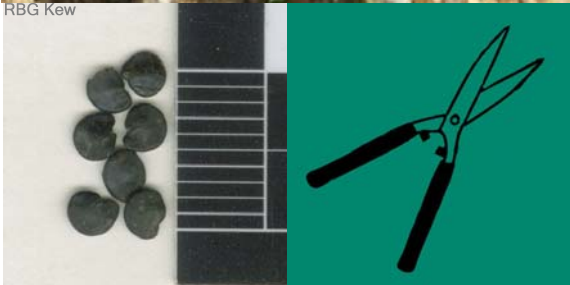
Credit: Maria Vorontsova / RBG Kew



Credit: Maria Vorontsova / RBG Kew
RBG Kew



Credit: Maria Vorontsova / RBG Kew



10-70
cm



Jan - Dec

Jan - Dec

Tertiary Gene Pool relative of *Solanum melongena* L.**HABIT:** Erect woody perennial herb, 0.5-1 m, heavily armed, branched at the base.**LEAVES:** Simple, blades 10-35 × 6-20 cm, 1.2-2 times longer than wide, elliptic, chartaceous, sparsely to densely stellate-pubescent on both sides.**INFLORESCENCE:** Lateral, extra-axillary, 4-7 cm long, unbranched, with 5-10 flowers. Plants strongly andromonoecious, with one long-styled flower at the base of the inflorescence and all other flowers short-styled, the flowers 5-merous.**FLOWER:** Calyx 1-3 cm long in long-styled flowers, 0.8-2 cm long in short-styled flowers. Corolla 3.5-6 cm in diameter in long-styled flowers, 1.5-3.5 cm in diameter in short-styled flowers, (white) pale mauve to purple, almost rotate, the abundant interpetalar tissue often tearing.**FRUIT:** A globose berry, 1(-2) per infructescence, 2.5-4 cm in diameter, spherical throughout development, rarely somewhat elongate, the pericarp thin, smooth, shiny, glabrous, plain green or with dark green stripes when young, yellow at maturity, drying orange-brown.**SEEDS:** ca. 50-100 per berry, 2.8-4.5 × 2-3.5 mm, flattened-reniform, almost round, orange to brown or almost black.**Habitat:**

Usually a forest species but also found on hillsides, savannah, grassland, or wasteland, frequently near water.

Distribution:

Common throughout the highlands of West, Central and East Africa, between ca. 15°N and ca. 5°S.

Altitude: 600 - 1600 m*Solanum dasyphyllum*May be confused with:
Other prickly Solanums

Distinguished by lack of distinct petiole or long-attenuate leaf bases, almost rotate corolla on short-styled flowers, and only 4(5) rays on the stellae on vegetative parts of the plant.



Other prickly Solanums in this area do not have this combination of characteristics.

Reported from Sudan
but no localities knownAll populations priority for
collection**References:** Vorontsova, M, (2009) *Solanum dasyphyllum*. In: Solanaceae Source. <http://solanaceaesource.org/content/solanum-dasyphyllum>.
Material for seed photo provided by IBPGR.

Tertiary Gene Pool relative of *Solanum melongena* L.



Raboud University Nijmegen Genebank

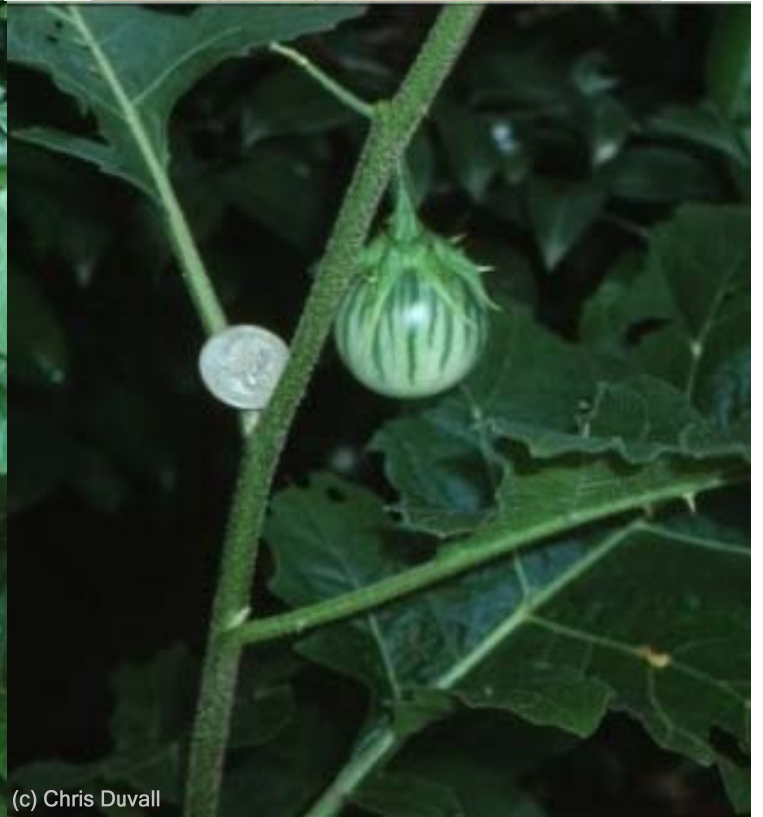


Raboud University Nijmegen Genebank



(c) Chris Duvall

Gemma Toothill (c) Board of Trustees RBG Kew



(c) Chris Duvall



0.5 mm



0.5-1 m



Jan - Dec

Jan - Dec

HABIT: Erect or scandent shrub, 0.5-1 m, prickly; Young stems terete, densely stellate-pubescent and prickly, the prickles 3-10 mm long, 1-3 mm wide at base, straight, occasionally curved; bark of older stems, brown to gray or orange-gray.

LEAVES: Simple, the blades 1-4(6) x 0.5-3(4) cm, 1-2 times longer than wide, ovate, membranous to chartaceous, yellow-green to grey-green or brown-green, stellate-pubescent; penninerved, occasionally with up to 5 nerves at base, midvein raised abaxially, flat adaxially.

INFLORESCENCE: Apparently terminal or lateral, 2-6.5 cm long, often branched once near the base, with (1)2-20 flowers.

FLOWER: Apparently all perfect, 5-merous. Calyx 2-4.5 mm long, Corolla 1.3-2.4 cm in diameter, mauve to purple or blue, stellate, lobed for ca. 4/5 of its length, the lobes 6-11 x 1.5-2 mm, lanceolate, reflexed, with a brown midvein; Stamens equal, with the filament tube ca. 0.5 mm.

FRUIT: A globose berry, 1-10 per infructescence, the pericarp thin, smooth, shiny, glabrous, orange to red at maturity; fruiting pedicels 7-16 mm long.

SEEDS: ca. 10-15 per berry, 2.5-4 x 1.8-3 x ca. 0.4 mm, flattened-reniform, brown-black, surface visibly rough, shiny, with raised outlines of cells or pits up to 0.25 mm diameter around the outer edge of the seed.

Habitat:

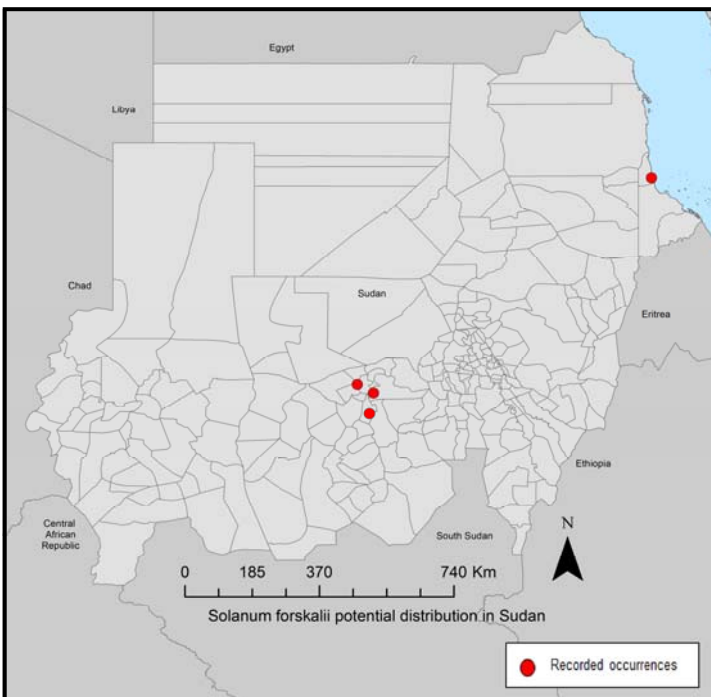
Scrub on stony ground and rocky slopes, often on granite.

Distribution:

Tropical Africa, Arabia, Sind and Rajputana.

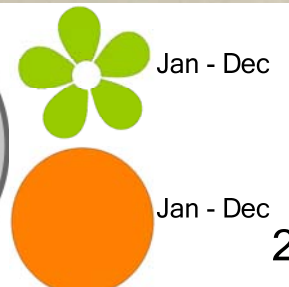
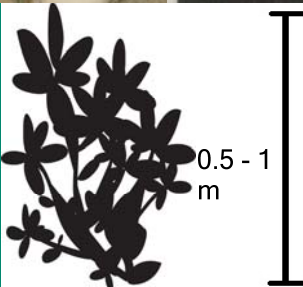
Altitude: 914 - 2000 m

<i>Solanum forskalii</i>	May be confused with: <i>Solanum cordatum</i>
Porrect trichomes with 6-10 rays over 0.15 mm long on the young stems. 1-20 flowers per inflorescence.	Multangulate trichomes with 12-18 rays under 0.15 mm long on the young stems. 1-2 flowers per inflorescence.



All populations priority for collection

References: Solanaceae Source Website, <http://www.nhm.ac.uk/research-curation/research/projects/solanaceaesource/taxonomy/description-detail.jsp?spnumber=2562> Accessed 29th August 2013



HABIT: Erect herb to shrub, 0.4-1.5 m, prickly. Young stems erect, robust, densely stellate-pubescent and prickly, bark of older stems orange-brown to grey.

LEAVES: Lobed to almost entire, the blades 6-22 cm long, 4-15 cm wide, ca. 1.5 times longer than wide, ovate, densely stellate-pubescent on both surfaces, with 0-5 prickles on both surfaces, petiole 1-9 cm long.

INFLORESCENCE: 3-8 cm long, not branched, with 5-10 flowers, 1-3 flowers open at any one time, densely stellate-pubescent, peduncle 1-4 mm long; pedicels 0.8-1.5 cm long in long-styled flowers, 0.5-0.9 cm long in short-styled flowers, 0-30 prickles on long-styled flowers, 0-5 prickles on short-styled flowers.

FLOWER: Flowers 5-merous, heterostylous, lowermost flower long-styled and hermaphrodite, the distal flowers short-styled and staminate. Corolla 2.4-3 cm in diameter in long-styled flowers, 1.5-2.3 cm in diameter in short-styled flowers, mauve, stellate, lobed for 1/3-1/2 of its length, broad-deltoid, spreading.

FRUIT: A spherical berry, 1(-2) per infructescence, 2.5-3.5 cm in diameter, the pericarp smooth, dark green with pale green and cream markings when young, yellow at maturity; fruiting calyx not accrescent, covering ca. 1/6 of the mature fruit, reflexed, with 5-60 prickles.

SEEDS: ca. 100-200 per berry, 2.2-2.8 mm long, 1.8-2.3 mm wide, flattened-reniform, dull yellow to orange-brown.

Habitat:

Thickets, scrubland, and savanna.

Distribution:

Predominantly in Ethiopia, Somalia, Arabia, and India, with some populations in N Kenya, Sudan, and extending to Mali.

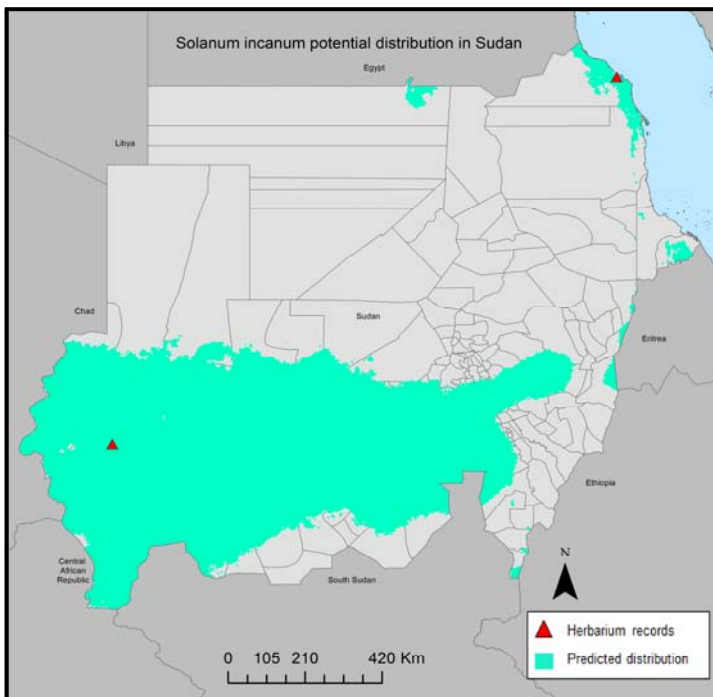
Altitude: 0 - 1900 m

Solanum incanum

Dense stellate trichomes with stalks up to 1 mm long, gently curved prickles (in Africa), leaves yellowish when dry.

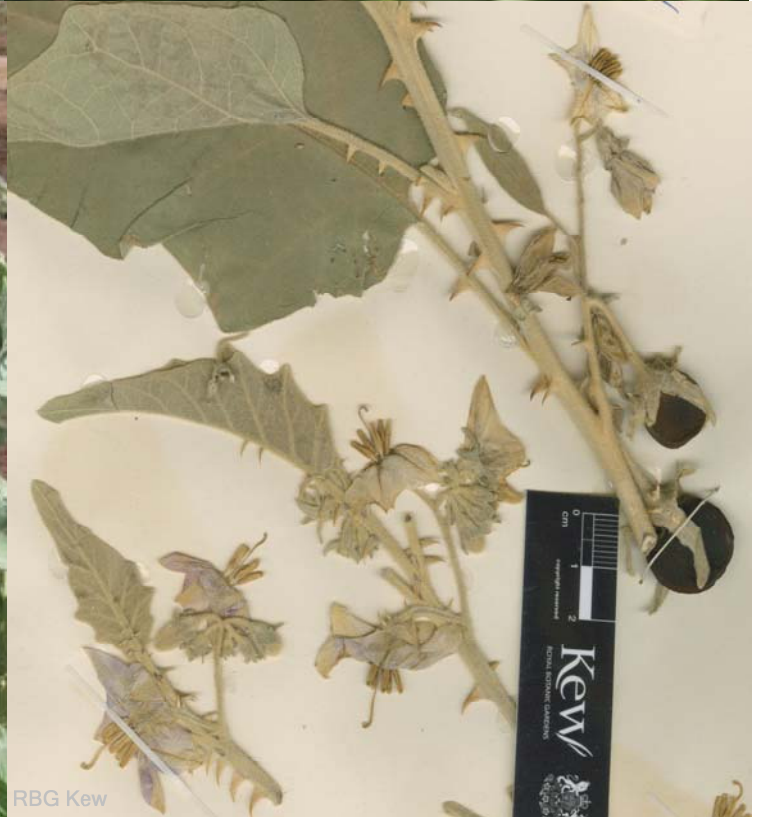
May be confused with:
Other prickly Solanums

Other prickly *Solanums* in Africa lack this combination of characters.



All populations priority for collection

References: Knapp, S. *Solanum incanum*. In *Solanaceae Source* <http://solanaceaesource.org/content/solanum-incanum> [Downloaded 09/06/14].



0.4-1.5 m

LC
PRELIM



Jan - Dec

Jan - Dec

Appendix - Synonyms

Taxon		Synonyms
Ipomoea ochracea (Lindl.) G. Don	1	Ipomoea curtisii House; Ipomoea ochracea var. curtisii (House) Stearn
Cicer cuneatum Hochst. ex A. Rich.	2	No synonyms
Vicia sativa L. subsp. nigra (L.) Ehrh.	3	Vicia angustifolia L.; Vicia angustifolia subsp. angustifolia L.; Vicia angustifolia subsp. pusilla Boiss.; Vicia angustifolia var. segetalis (Thuill.) Arcang.; Vicia angustifolia subsp. segetalis (Thuill.) Arcang.; Vicia angustifolia var. uncinata (Desv.) Rouy; Vicia bobartii E.Forst.; Vicia bobartii Koch; Vicia canadensis Zuccagni; Vicia cuneata Guss.; Vicia debilis Perez Lara; Vicia heterophylla C.Presl; Vicia lanciformis Lange; Vicia maculata C.Presl; Vicia pilosa M.Bieb.; Vicia sativa var. angustifolia (L.) Wahlb.; Vicia sativa var. angustifolia L.; Vicia sativa subsp. angustifolia (L.) Gaudin; Vicia sativa subsp. angustifolia (L.) Batt.; Vicia sativa subsp. consobrina (Pomel) Quezel & Santa; Vicia sativa subsp. cordata (Hoppe) Batt.; Vicia sativa subsp. cuneata (Guss.) Maire; Vicia sativa subsp. heterophylla (C.Presl) J.Duvign.; Vicia sativa var. minor (Bertol.) Ohwi; Vicia sativa var. nigra L.; Vicia segatalis Thuill.
Vigna ambacensis Welw. ex Baker	4	Vigna ambacensis var. pubigera (Baker) Maréchal; Vigna pubigera Baker; Vigna stuhlmannii Harms
Vigna luteola (Jacq.) Benth.	5	Dolichos luteolus Jacq.; Dolichos niloticus Delile; Dolichos repens L.; Vigna glabra Savi; Vigna nilotica (Delile) Hook. f.; Vigna repens (L.) Kuntze
Vigna multinervis Hutch. & Dalziel	6	Vigna linearifolia Hutch.
Vigna reticulata Hook. f.	7	Vigna andongensis Baker; Vigna linearifolia Hook.f.; Vigna polytricha Baker
Vigna schimperii Baker	8	No synonyms
Vigna vexillata (L.) A. Rich.	9	Phaseolus capensis Thunb.; Phaseolus vexillatus L.; Plectrotropis angustifolia Schumach.; Strophostyles capensis var. ovatus E. Mey.; Vigna capensis (Thunb.) Burt Davy; Vigna davyi Bolus; Vigna hirta Hook
Eleusine africana K. OByrne	10	Eleusine coracana subsp. africana (Kenn.-O'Byrne) Hilu & de Wet; Eleusine indica subsp. africana (Kenn.-O'Byrne) S.M.Phillips
Eleusine indica (L.) Gaertn.	11	Agropyron geminatum Schult. & Schult.f.; Chloris repens Steud.; Cynodon indicus (L.) Raspail; Cynosurus ara Buch.-Ham. ex Wall.; Cynosurus indicus L.; Cynosurus pectinatus Lam.; Eleusine distachya Trin. ex Steud.; Eleusine distans Link; Eleusine distans Moench; Eleusine domingensis Sieber ex Schult.; Eleusine glabra Schumach.; Eleusine gonantha Schrank; Eleusine gouinii E.Fourn.; Eleusine inaequalis E.Fourn.; Eleusine indica var. major E.Fourn.; Eleusine indica var. monostachya F.M.Bailey; Eleusine indica var. oligostachya Honda; Eleusine indica var. sandaensis Vanderyst; Eleusine japonica Steud.; Eleusine macrosperma Stokes; Eleusine marginata Lindl.; Eleusine polydactyla Steud.; Eleusine rigidifolia E.Fourn.; Eleusine scabra E.Fourn.; Eleusine textilis Welw.; Juncus loureiroana Schult. & Schult.f.; Leptochloa pectinata (Lam.) Kunth; Paspalum dissectum Kniph.; Poa spicata Willd. ex Steud.; Triticum geminatum Spreng.

Appendix - Synonyms

b

Taxon		Synonyms
Oryza barthii A. Chev.	12	Oryza breviligulata A.Chev. & Roehr.; Oryza glaberrima subsp. barthii (A.Chev.) De Wet; Oryza mezii Prodoehl; Oryza perennis subsp. barthii (A.Chev.) A.Chev.; Oryza stapfii Roshev.
Oryza brachyantha A. Chev. & Roehr.	13	Oryza brachyantha var. guineensis A.Chev.
Oryza longistaminata A. Chev. & Roehr.	14	Oryza dewildemanii Vanderyst [Invalid]; Oryza madagascariensis (A.Chev.) Roshev.; Oryza perennis subsp. madagascariensis A.Chev.; Oryza silvestris Stapf ex A.Chev. [Invalid]
Oryza punctata Kotschy ex Steud.	15	Oryza eichingeri var. longiaristata Peter; Oryza sativa var. punctata (Kotschy ex Steud.) Kotschy; Oryza schweinfurthiana Prodoehl
Pennisetum glaucum (L.) R. Br subsp. monodii (Maire) Brunken	16	No synonyms
Pennisetum stenostachyum Kloyzcsch ex. A. Br. and Bouche	17	Pennisetum polystachion (L.) Schult..
Sorghum arundinaceum (Desv.) Stapf	18	Andropogon arundinaceus Willd.; Andropogon arundinaceus var. effusus Hack.; Andropogon halepensis var. kinshasanensis Vanderyst; Andropogon sorghum subsp. abyssinicus Piper; Andropogon sorghum var. aethiopicus Hack.; Andropogon sorghum subsp. effusus (Hack.) Hitchc.; Andropogon sorghum var. effusus Hack.; Andropogon sorghum subsp. verticilliflorus (Steud.) Piper; Andropogon sorghum subsp. vogelianus Piper; Andropogon stapfii Hook.f.; Andropogon verticilliflorus Steud. ; Holcus sorghum subsp. effusus (Hack.) Hitchc.; Holcus sorghum subsp. verticilliflorus (Steud.) Hitchc.; Rhaphis arundinacea Desv.; Sorghum abyssinicum (Piper) Stapf; Sorghum aethiopicum (Hack.) Rupr. ex Stapf; Sorghum aethiopicum var. brevifolium Snowden; Sorghum bicolor subsp. arundinaceum (Desv.) de Wet & J.R. Harlan; Sorghum bicolor subsp. verticilliflorum (Steud.) de Wet ex Wiersema & J.Dahlb.; Sorghum brevicarinatum Snowden; Sorghum brevicarinatum var. swahilorum Snowden; Sorghum castaneum C.E.Hubb. & Snowden; Sorghum halepense f. aristatum Rendle; Sorghum halepense var. effusum (Hack.) Rendle; Sorghum halepense var. effusum (Stapf) Burt Davy; Sorghum halepense f. submuticum Hack.; Sorghum lanceolatum Stapf; Sorghum macrochaetum Snowden; Sorghum panicoides Stapf; Sorghum pugionifolium Snowden; Sorghum somaliense Snowden; Sorghum stapfii (Hook.f.) C.E.C.Fisch.; Sorghum usambarensense Snowden; Sorghum verticilliflorum (Steud.) Stapf; Sorghum verticilliflorum var. infrequens Snowden; Sorghum verticilliflorum var. ornatum Snowden; Sorghum vogelianum (Piper) Stapf
Sorghum bicolor (L.) Moench subsp. verticilliflorum (Steud.) de Wet ex Wiersema & J. Dahlb.	19	Sorghum verticilliflorum (Steud.) Stapf; Sorghum brevicarinatum Snowden; Andropogon sorghum (L.) Brot. var. aethiopicus Hack.; Andropogon sorghum (L.) Brot. subsp. vogelianus Piper; Sorghum vogelianum (Piper) Stapf; Sorghum usambarensense Snowden; Sorghum macrochaeta Snowden; Sorghum bicolor (L.) Moench subsp. arundinaceum (Desv.) de Wet & J. R. Harlan ex Davidse; Rhaphis arundinacea Desv.; Sorghum virgatum (Hack.) Stapf; Sorghum stapfii (Hook. f.) C. E. C. Fisch.; Holcus sorghum L. var. effusus Hitchc.; Andropogon arundinaceus Willd.; Andropogon sorghum (L.) Brot. var. virgatus Hack.; Andropogon sorghum (L.) Brot. var. effusus Hack.; Andropogon verticilliflorus Steud.; Sorghum pugionifolium Snowden; Holcus sorghum L. var. verticilliflorus (Steud.) Hitchc.; Sorghum arundinaceum (Desv.) Stapf; Sorghum lanceolatum Stapf; Sorghum aethiopicum (Hack.) Rupr. ex Stapf; Andropogon stapfii Hook. f.

Appendix - Synonyms

Sorghum purpureosericeum (Hochst. ex A. Rich.) Asch. & Schweinf.	20	Andropogon pappii Gand.; Andropogon purpureosericeus Hochst. ex A.Rich.; Andropogon purpureosericeus var. calomelas Hack.; Andropogon purpureosericeus var. pallidior Hack.; Sarga purpureosericea (Hochst. ex A.Rich.) Spangler; Sorghum deccanense Stapf ex Raizada; Sorghum dimidiatum Stapf; Sorghum purpureosericeum subsp. deccanense Garber; Sorghum purpureosericeum subsp. dimidiatum (Stapf) Garber
Sorghum virgatum (Hack.) Stapf	21	Andropogon sorghum (L.) Brot. variety virgatus Hack.; Holcus virgatus (Hack.) L.H.Bailey; Sorghum bicolor (L.) Moench variety virgatum (Hack.) de Wet & Harlan
Solanum campylacanthum	22	Solanum antidotum Dammer; Solanum astrochlaenoides Dammer; Solanum benguelense Peyr.; Solanum bojeri Dunal, in DC.; Solanum bojeri var. deckenii (Dammer) Bitter; Solanum bojeri var. houyanum Bitter; Solanum bojeri var. integrum Bitter; Solanum bojeri var. sinuatorepandum Dunal, in DC.; Solanum bussei Dammer; Solanum cufodontii Lanza; Solanum deckenii Damme; Solanum delagoense var. astrochlaenoides (Dammer) Bitter; Solanum delagoense var. benguelense (Peyr.) Bitter; Solanum delagoense var. fischeri (Dammer) Bitter; Solanum delpierrei De Wild.; Solanum endlichii Dammer; Solanum fischeri Dammer; Solanum goniocalyx Lanza; Solanum himatacanthum Dammer; Solanum iodes Dammer; Solanum macrosepalum Dammer; Solanum magdalenae Dammer; Solanum malacochlamys Bitter; Solanum malacochlamys var. transgrediens Bitter; Solanum maranguense Bitter; Solanum melongenifolium Lanza; Solanum merkeri Dammer; Solanum merkeri subsp. militans Bitter; Solanum merkeri var. endastrophorum Bitter; Solanum merkeri var. intermontanum Bitter; Solanum merkeri var. mediidominans Bitter; Solanum merkeri var. ruandense Bitter; Solanum merkeri var. tobleri Bitter; Solanum mesomorphum Bitter; Solanum neumannii Dammer; Solanum neumannii var. schoense Bitter; Solanum pembae Bitter; Solanum psilostylum Dammer; Solanum repandifrons Bitter; Solanum secedens Dammer; Solanum sennii Chiov.; Solanum ukerewense Bitter; Solanum urbanianum Dammer; Solanum verbascifrons Bitter; Solanum volkensii Dammer; Solanum volkensii var. himatiacanthum (Dammer) Bitter; Solanum suaveolens Bojer
Solanum cerasiferum Dunal	23	Solanum crepinii Van Heurck; Solanum duchartei Heckel; Solanum heteracanthum Dunal; Solanum pachycalyx Van Heurck & Müll.Arg.; Solanum yolense Hutch. & Dalziel
Solanum coagulans Forssk.	24	Solanum dubium Fresen.; Solanum dubium var. brevipetiolatum Dunal; Solanum dubium var. cisterninum Dunal; Solanum hedjazense Dunal; Solanum thruppii C.H.Wright; Solanum ellenbeckii Dammer; Solanum depressum Bitter; Solanum ellenbeckii var. oligoplum Bitter; Solanum dubium var. denseaculeatum Bitter; Solanum dubium var. dolichoplocalyx Bitter; Solanum dubium var. subinerme (Dunal) Bitter
Solanum dasyphyllum Schumach.	25	Solanum duplosinuatatum Klotzsch

Appendix - Synonyms

Solanum forskalii Dunal	26	Solanum albicaule Kotschy ex Dunal; Solanum indicum Prain
Solanum incanum L.	27	Solanum sanctum L.; Solanum incanum Forssk.; Solanum unguiculatum A.Rich.; Solanum coagulans var. griseum Dunal; Solanum coagulans var. ochraceum Dunal; Solanum hierochuntinum Dunal; Solanum hierochuntinum var. lanuginosum Dunal; Solanum melongena var. incanum (L.) Kuntze; Solanum floccosistellatum Bitter; Solanum incanum subsp. horridescens Bitter; Solanum incanum var. brevitomentosum Bitter; Solanum incanum var. integrascens Bitter; Solanum incanum var. kavirondoense Bitter; Solanum incanum var. pluribaccatum Bitter; Solanum incanum var. unguiculatum (A.Rich.) Bitter.