

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

Mozambique



Seed Collecting Guide

Please cite this guide as:
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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: Beans, CREDIT: Neil Palmer/CIAT;

TOP RIGHT: Maize, CREDIT: Neil Palmer/CIAT;

BOTTOM LEFT: Rice, CREDIT: Neil Palmer/CIAT;

BOTTOM RIGHT: *Ipomoea involucrata* CREDIT: RBG Kew.

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.



MILLENNIUM
SEED BANK
PARTNERSHIP



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.

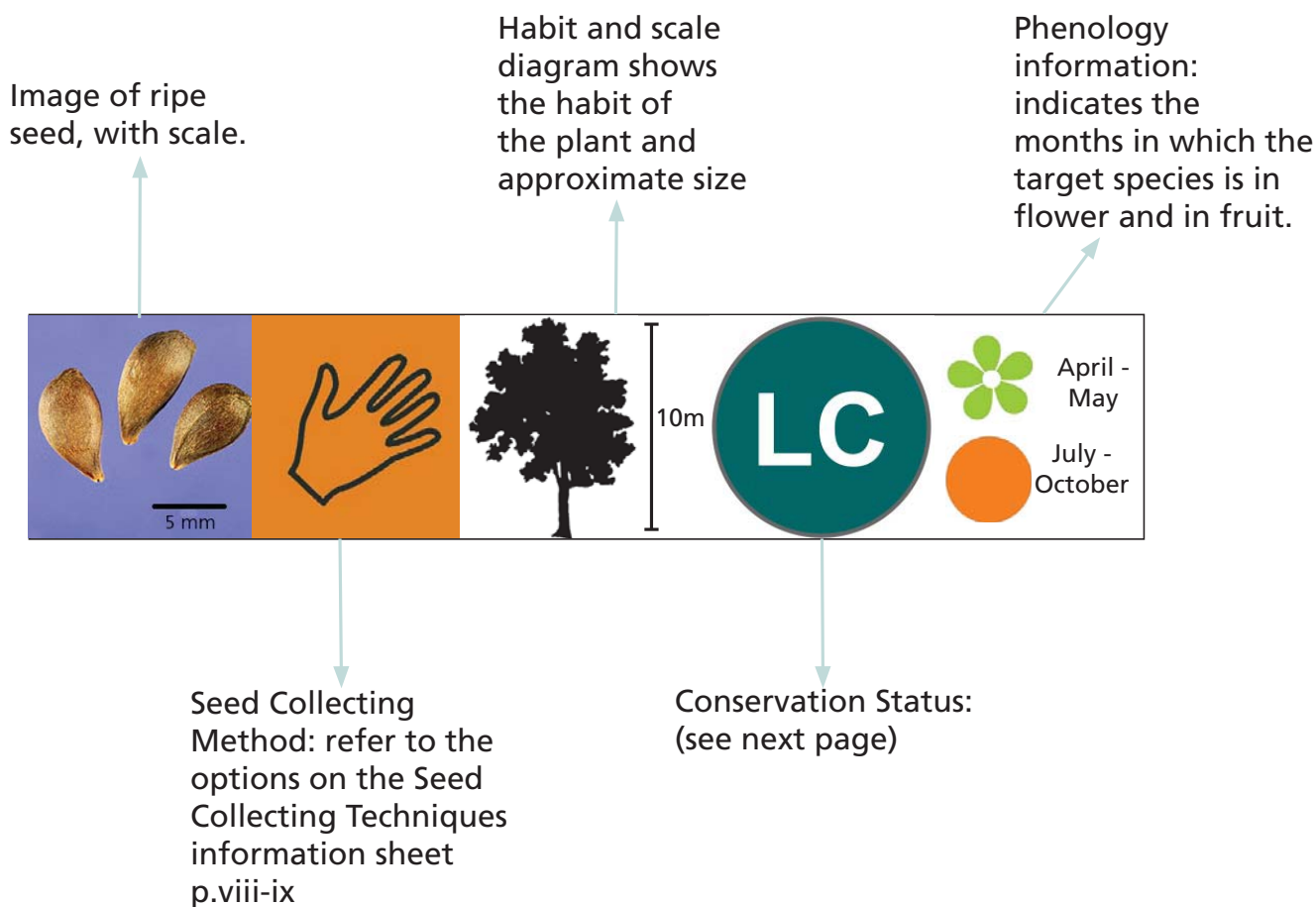
The species included in this guide are a selection of the wild relatives of the 29 key crops which this project covers (African Rice, Alfalfa, Apple, Aubergine, Bambara groundnut, Banana, Barley, Bread Wheat, Butter Bean, Carrot, Chickpea, Common Bean, Cowpea, Faba bean, Finger millet, Grasspea, Lentil, 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.

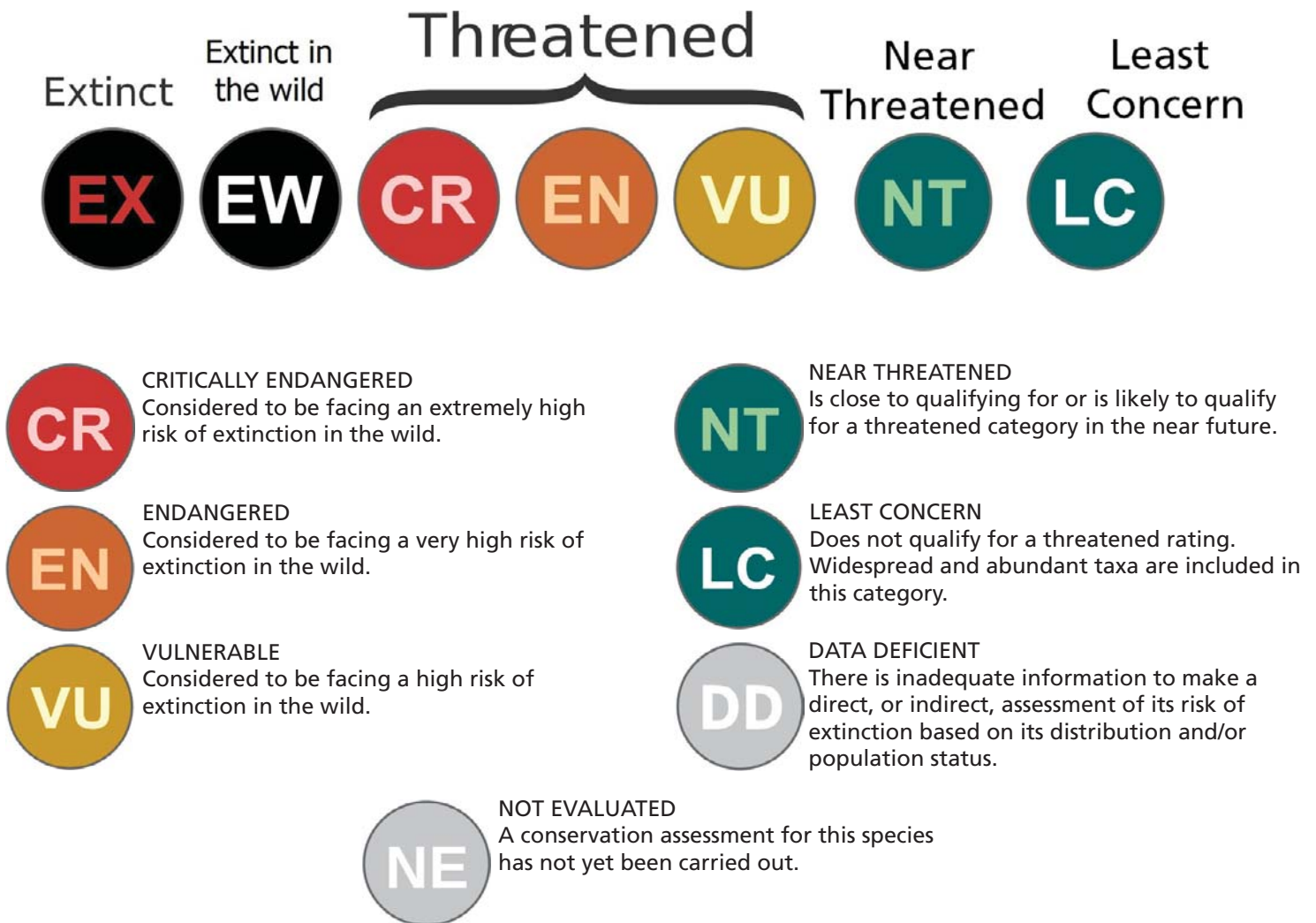
On each species profile, there is a collection of images to help identify the target species, accompanied by a series of symbols :



Conservation Assessments

Conservation Status:

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

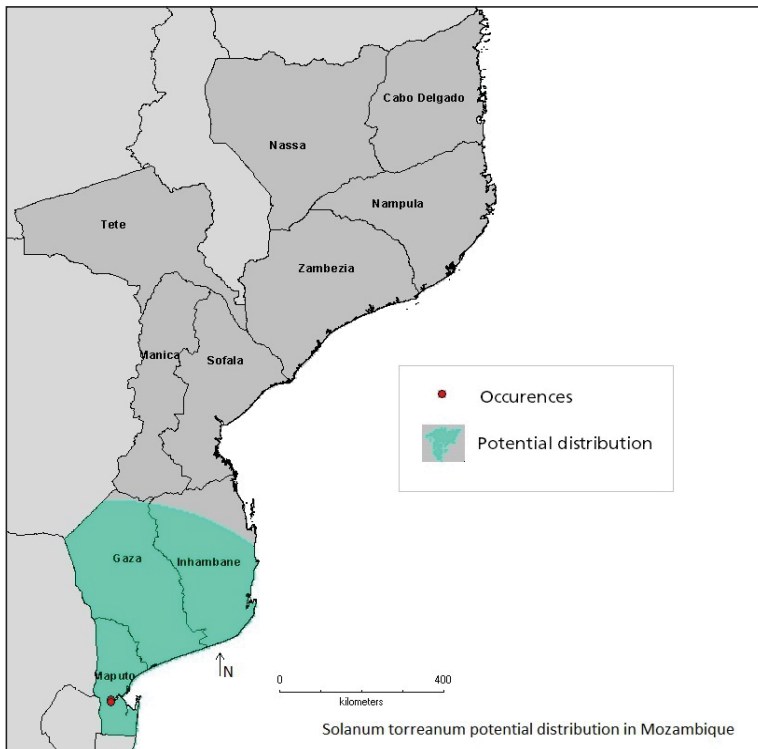


Where a full conservation assessment has not been completed, a preliminary conservation rating may be indicated. Preliminary assessments are produced using specimen locality data and GIS, which calculates two parameters accepted by IUCN as suitable measures of range: namely extent of occurrence (EOO) 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:

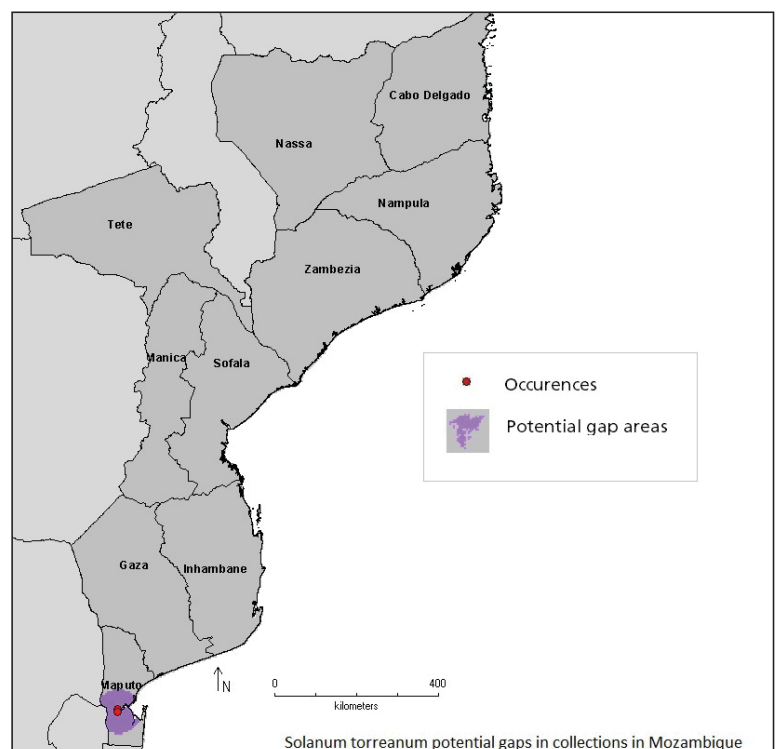


Maps

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>

African Vigna: an interactive key

http://keys.lucidcentral.org/keys/African_Vigna/default.htm

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 15 March 2012; 14:30 GMT]

Maxted, N., Mabuza-Dlamini, P., Moss, H., Padulosi, S., Jarvis, A. & Guarino, L., (2004). An Ecogeographic Survey: African Vigna. Systematic and Ecogeographic Studies of Crop Genepools 10. pp. 1-468. IPGRI, Rome.

Al-Atawneh, N., Shehadeh, A., Amri, A. & Maxted, N., (2009). Conservation Field Guide to Medics of the Mediterranean Basin. Pp. 1-214. ICARDA, Syria.

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.

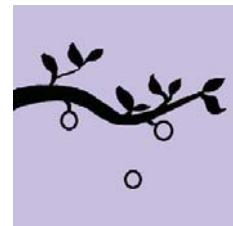


This is a very effective technique when:

- 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.

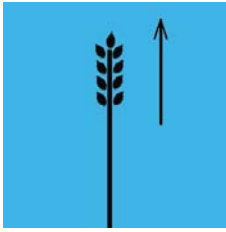
This technique may not be suitable for light, plumed seed from Bombacaceae and Asclepiadaceae, which may be carried away by air currents.



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 inflorescences (seedheads). Grasp the seed-heads 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.

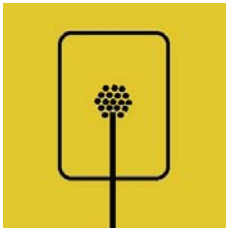


The stripping technique is most suitable for:

- dense, mono-specific stands of target species with no weed or other species present; and
- inflorescences 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.

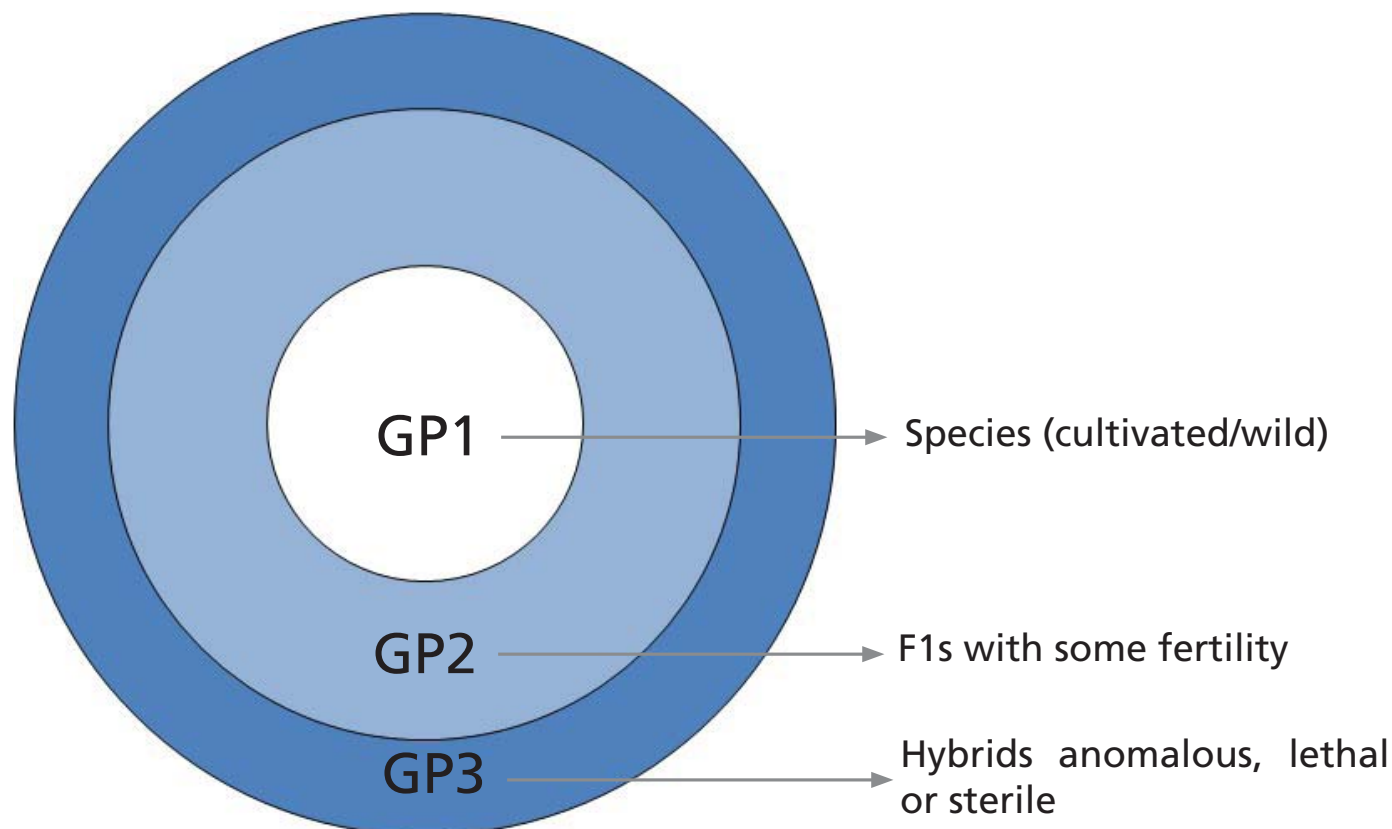
Place collections of dry, ripe seed into cloth or paper bags for transit. Store any awned seed or hooked fruit, that would damage or get stuck in cotton bags, in cardboard boxes or strong paper bags. Never collect or store seeds in plastic bags.

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

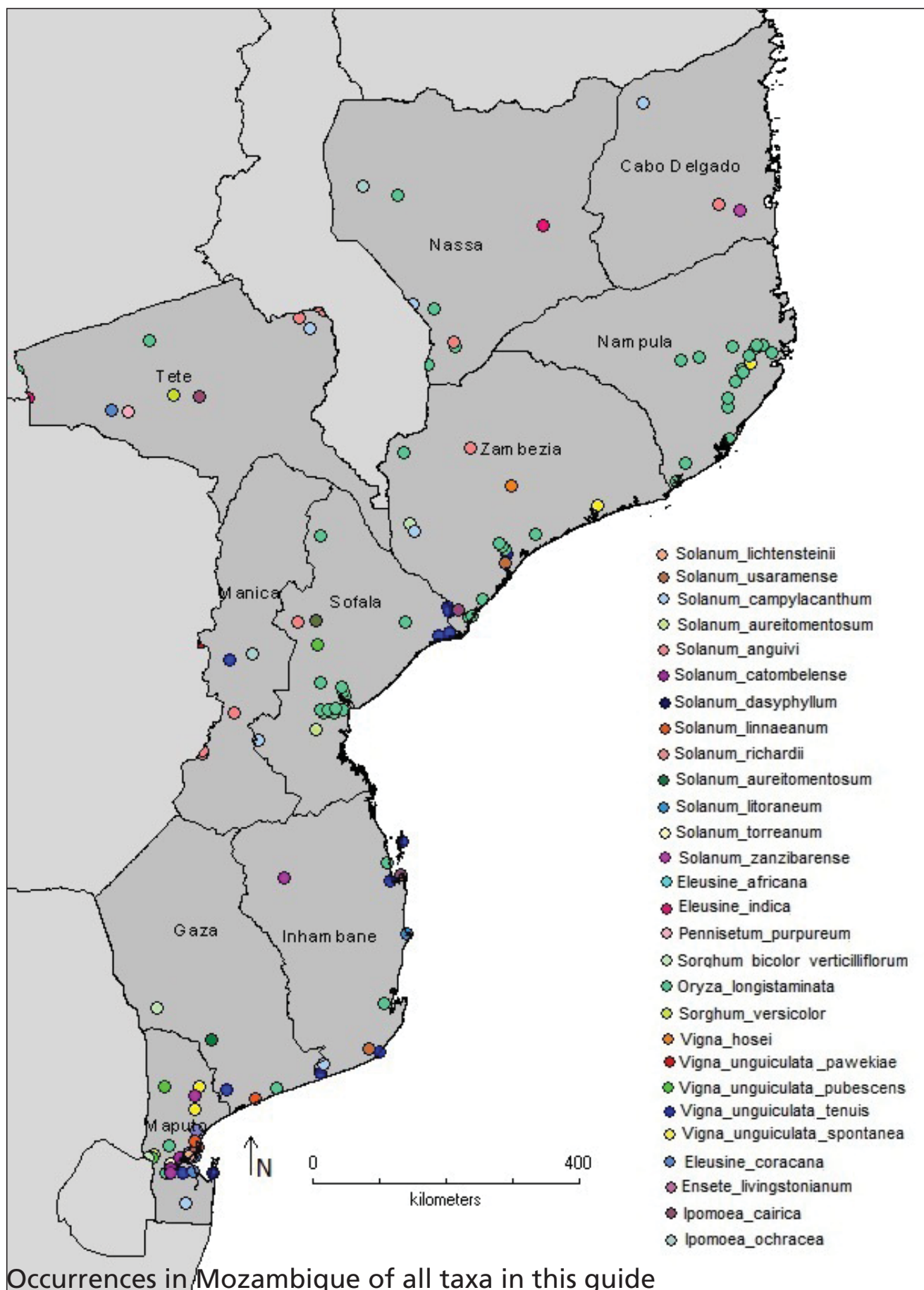
Taxon Group 2 – species in same series/section as crop

Taxon Group 3 – species in same subgenus as crop

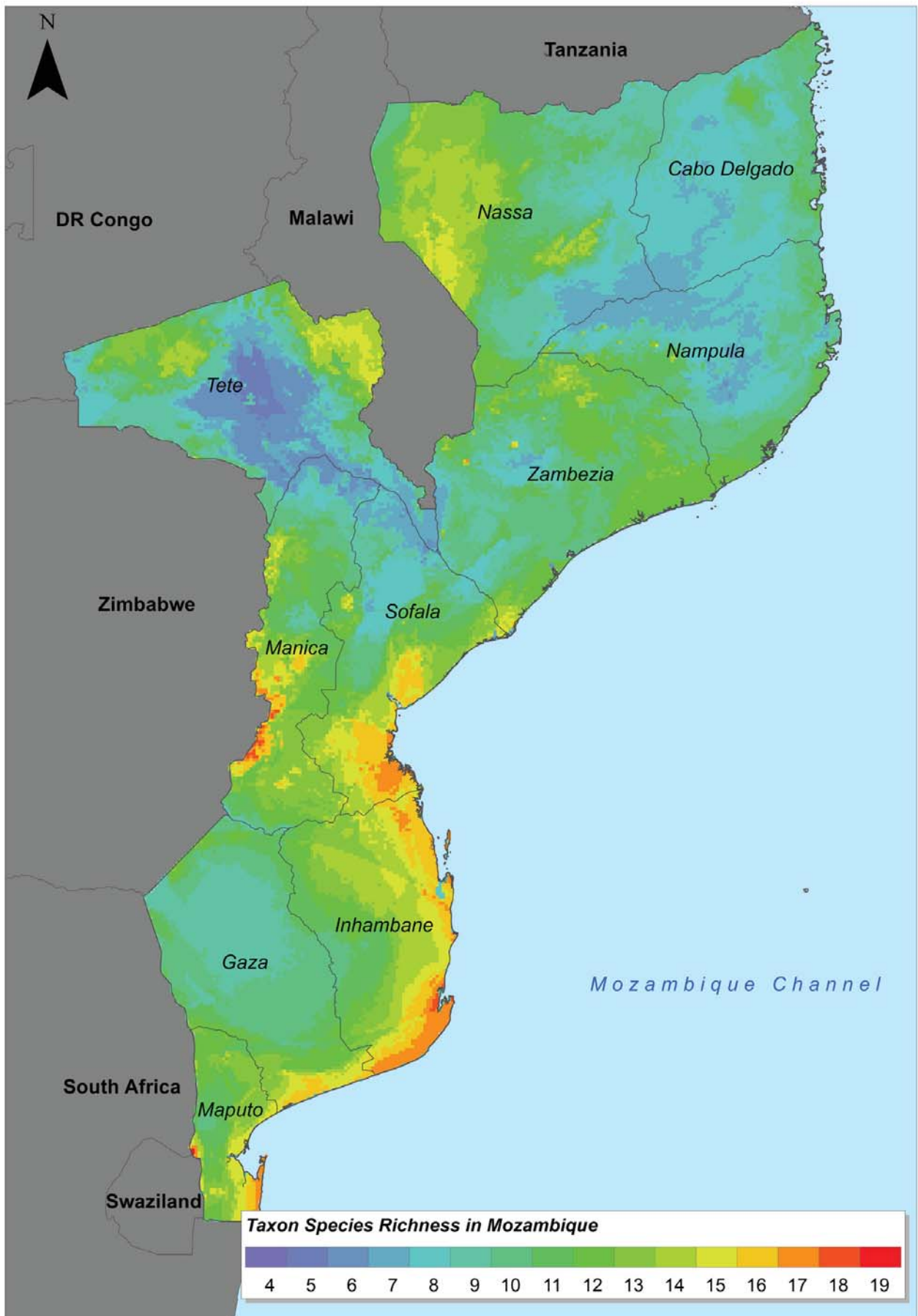
Harlan, J. and J. de Wet (1971). Towards a rational classification of cultivated plants. *Taxon* 20: 509-517.

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.

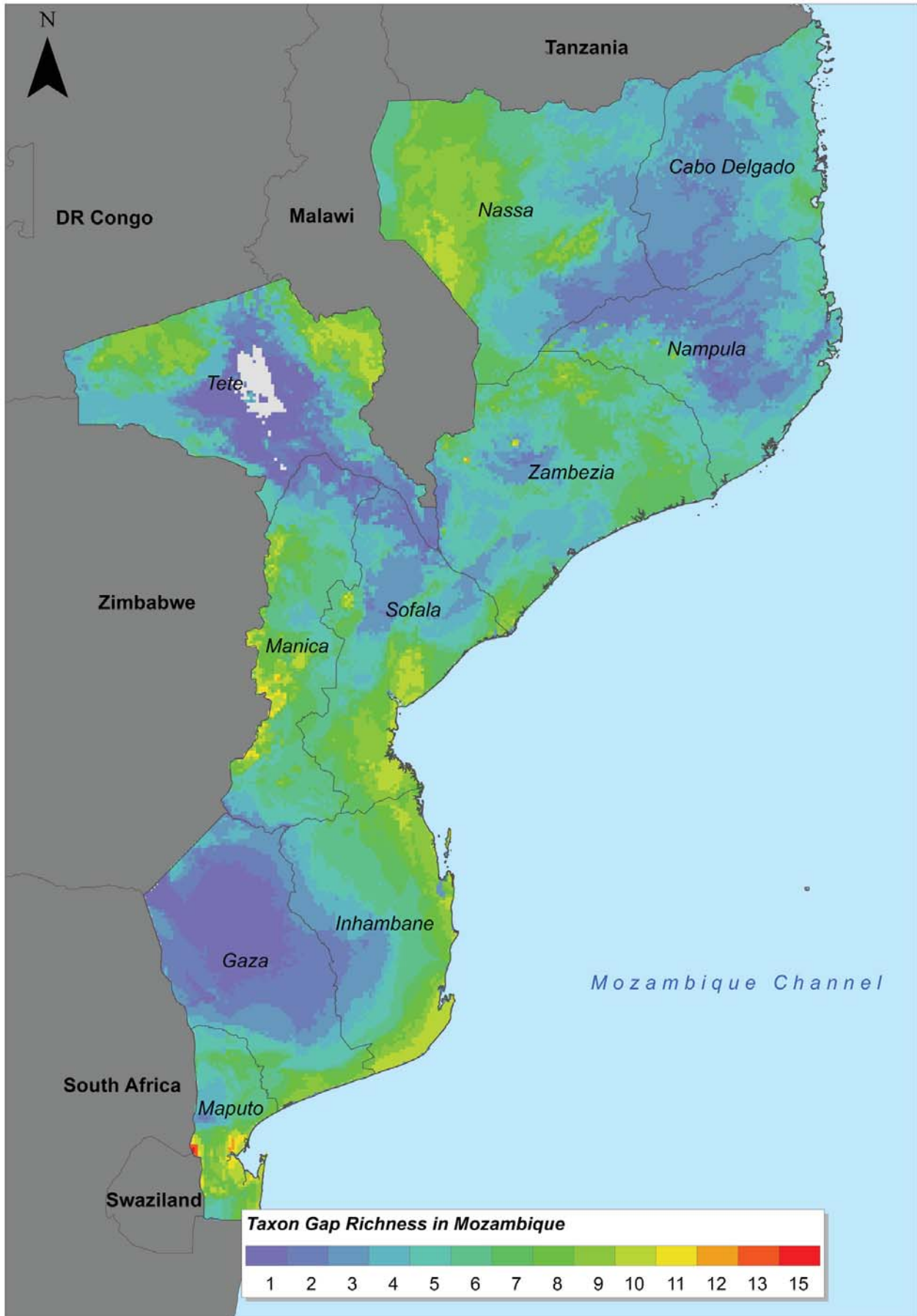
Occurrences of all taxa in this guide, as a point distribution



Species richness



Collecting Gaps



Species in this guide - High priority for collecting

Family	Taxon	Genepool	Sheet	Conservation Status
SOLANACEAE	<i>Solanum anguivi</i> Lam.	Secondary genepool of eggplant	1	LC (prelim)
SOLANACEAE	<i>Solanum campylacanthum</i> Hochst. ex A. Rich.	Secondary genepool of eggplant	2	LC (prelim)
SOLANACEAE	<i>Solanum catombelense</i> Peyr.	Tertiary genepool of eggplant	3	LC (prelim)
SOLANACEAE	<i>Solanum dasyphyllum</i> Schumach.	Tertiary genepool of eggplant	4	LC (prelim)
SOLANACEAE	<i>Solanum linnaeanum</i> Hepper & P.M. L. Jaeger	Secondary genepool of eggplant	5	LC (prelim)
SOLANACEAE	<i>Solanum richardii</i> Dunal	Tertiary genepool of eggplant	6	LC (prelim)
SOLANACEAE	<i>Solanum aurietomentosum</i> Bitter	Relative of eggplant	7	LC (prelim)
SOLANACEAE	<i>Solanum litoraneum</i> A.E.Gonç.	Relative of eggplant	8	EN (prelim)
SOLANACEAE	<i>Solanum torreanum</i> A.E.Gonç.	Relative of eggplant	9	NT (prelim)
SOLANACEAE	<i>Solanum usaramense</i> Dammer	Relative of eggplant	10	LC (prelim)
SOLANACEAE	<i>Solanum zanzibarensis</i> Vatke	Relative of eggplant	11	LC (prelim)
POACEAE	<i>Eleusine africana</i> K. OByrne	Primary genepool of Finger millet	12	LC (prelim)
POACEAE	<i>Eleusine indica</i> (L.) Gaertn.	Relative of Finger millet	13	LC
POACEAE	<i>Pennisetum purpureum</i> Schumach.	Secondary genepool of Pearl millet	14	LC (prelim)
POACEAE	<i>Sorghum bicolor</i> (L.) Moench subsp. <i>verticilliflorum</i> (Steud.) de Wet ex Wiersema & J. Dahlb.	Primary genepool relative of Sorghum	15	LC (prelim)
POACEAE	<i>Oryza schweinfurthiana</i> Prodoehl	Secondary relative of rice	16	LC (prelim)

Species in this guide - Lower priority for collecting

Family	Taxon	Genepool	Sheet	Conservation Status
SOLANACEAE	<i>Solanum lichtensteinii</i> Willd.	Tertiary genepool of eggplant	17	LC (prelim)
POACEAE	<i>Eleusine coracana</i> (L.) Gaertn.		18	LC (prelim)
MUSACEAE	<i>Ensete livingstonianum</i> (J.Kirk) Cheesman	Taxon Group 4 relative of Abyssinian banana	19	LC
POACEAE	<i>Oryza longistaminata</i> A. Chev. & Roehr.	Primary genepool of rice	20	LC (prelim)
POACEAE	<i>Sorghum versicolor</i> Andersson	Tertiary genepool of Sorghum	21	LC (prelim)
LEGUMINOSAE	<i>Vigna hosei</i> (Craib) Backer	Secondary genepool of Bambara groundnut	22	LC (prelim)
LEGUMINOSAE	<i>Vigna unguiculata</i> subsp. <i>pawekiae</i> Pasquet	Primary genepool of Cowpea	23	LC (prelim)
LEGUMINOSAE	<i>Vigna unguiculata</i> subsp. <i>pubescens</i> (R. Wilczek) Pasquet	Primary genepool of Cowpea	24	LC (prelim)
LEGUMINOSAE	<i>Vigna unguiculata</i> subsp. <i>tenuis</i> (E. Mey.) Marechal et al.	Primary genepool of Cowpea	25	LC (prelim)
LEGUMINOSAE	<i>Vigna unguiculata</i> var. <i>spontanea</i> (Schweinf.) Pasquet	Primary genepool of Cowpea	26	LC (prelim)
CONVOLVULACEAE	<i>Ipomoea cairica</i> (L.) Sweet	Relative of sweet potato	27	LC (prelim)
CONVOLVULACEAE	<i>Ipomoea ochracea</i> (Lindl.) G. Don	Relative of sweet potato	28	LC (prelim)

Taxon	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
<i>Solanum lichtensteinii</i>	Flower	Flower	Flower	Flower	Flower	Flower	Flower	Flower	Flower	Flower	Flower	Flower
<i>Eleusine coracana</i>		Flower	Flower	Flower	Flower	Flower	Flower					
<i>Ensete livingstonianum</i>		Flower				Flower						
<i>Oryza longistaminata</i>	Flower	Flower	Flower	Flower	Flower	Flower	Flower	Flower	Flower	Flower	Flower	Flower
<i>Sorghum versicolor</i>		Flower	Flower	Flower	Flower							
<i>Vigna hosei</i>	Flower	Flower	Flower	Flower	Flower	Flower	Flower	Flower	Flower	Flower	Flower	Flower
<i>Vigna unguiculata subsp. pawekiae</i>			Flower	Flower	Flower	Flower	Flower	Flower	Flower	Flower	Flower	Flower
<i>Vigna unguiculata subsp. pubescens</i>	Flower	Flower	Flower	Flower				Flower	Flower	Flower	Flower	Flower
<i>Vigna unguiculata subsp. tenuis</i>	Flower	Flower	Flower	Flower				Flower	Flower	Flower	Flower	Flower
<i>Vigna unguiculata var. spontanea</i>	Flower	Flower	Flower	Flower		Flower			Flower			Flower
<i>Ipomoea cairica</i>	Flower	Flower	Flower	Flower	Flower	Flower	Flower					
<i>Ipomoea ochracea</i>	Flower	Flower	Flower	Flower	Flower	Flower	Flower	Flower	Flower	Flower	Flower	Flower

KEY

 Species in flower

 Species in fruit

data gathered from literature and herbarium specimens

HABIT Erect woody herb or shrub, up to c. 4 m tall. Stems and leaves armed with straight or somewhat curved spines, yellowish to brownish, sometimes purple near the base, up to 13 mm long, branches often purple tinged. All parts covered in stellate hairs.

LEAVES: rhombic-ovate, elliptic or lanceolate, thinly stellate hairy above, densely so below. The central ray of the stellate hairs often much longer than the lateral rays. Leaf margin subentire to triangularly lobed. Prickles usually present on the midrib and main veins.

FLOWERS in up to 20-flowered racemose heads. Corolla pale mauve or purple to almost whitish, star-shaped.

FRUITS 6-12 mm in diameter, spherical, green, turning yellow and glossy orange-red when ripe. Edible when mature.

Habitat:



Markedly tolerant of open and shady sites in and at edges of both dry and wet forests, montane grassland and bushland, riverine associations, savanna woodland, thickets and coastal bushland.

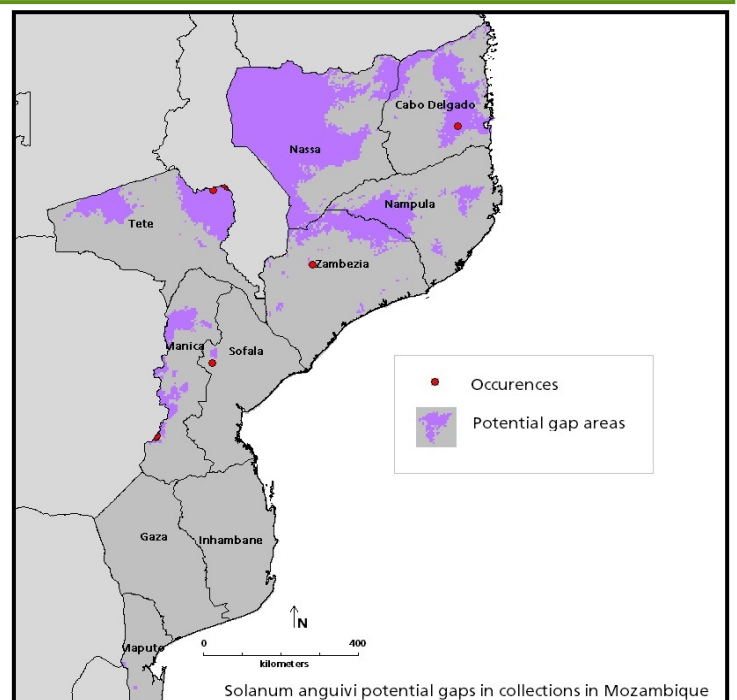
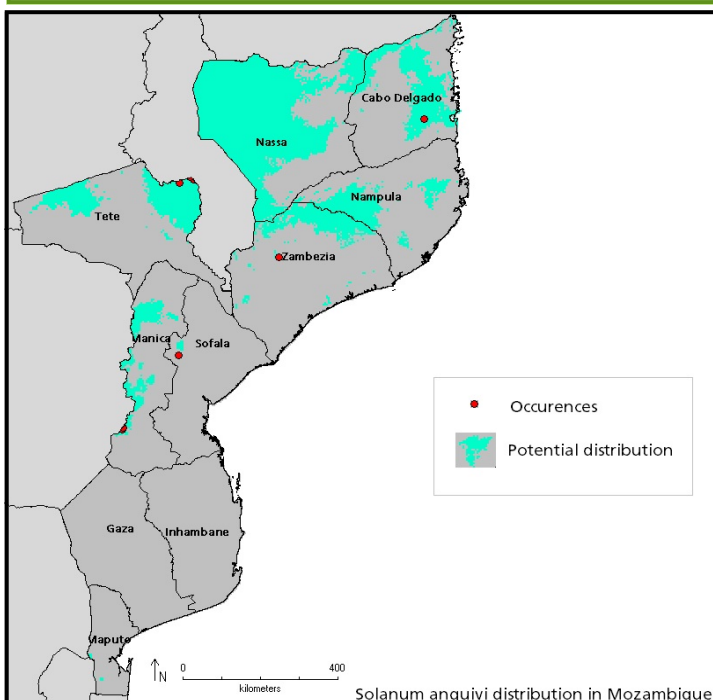
Altitude: 0 - 2380 m

Distribution:

Widespread in tropical Africa; recorded from West and East Africa extending northwards to Ethiopia and southwards to South Africa (KwaZulu-Natal), and also from Angola and Dem. Rep. Congo, occurring also in Aldabra, Comoro, Madagascar and Mascarenes Is., and known also from the Arabian Peninsula.

DISTINGUISHING FEATURES OF THIS SPECIES:

<p><i>Solanum anguivi</i></p> <p>Ripe fruit is red.</p> 	<p>May be confused with: <i>Solanum torvum</i></p> <p>Fruit yellow when fully ripe.</p> 
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References: FZ volume:8 part:4 (2005) Solanaceae by A.E. Gonçalves; Hyde, M.A., Wursten, B.T. & Ballings, P. (2012). Flora of Zimbabwe: Species information: *Solanum anguivi*; Plant Resources of Tropical Africa (PROTA) website: <http://www.prota.co.ke/en/home>; Edible Wild Plants of Tanzania, Ruffo, C.K., 2002. Material for seed image provided by South African National Biodiversity Institute.



Credit: G.A. Cooper, courtesy of Smithsonian Institution.



Credit: BT Wursten



Credit: BT Wursten

Gemma Toothill (c) Board of Trustees RBG Kew



0.5 mm



2-4 m



Apr - Jul

Apr - Jul

Secondary gene pool of Eggplant - *Solanum melongena* L.

Erect shrub, 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,

Inflorescences apparently terminal or lateral, 2-11 cm long.

Flowers (4-)5(-6)-merous, heterostylous and the plants andromonoecious, with 1-3(5) long-styled flowers at the base of the inflorescence. 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 etc.

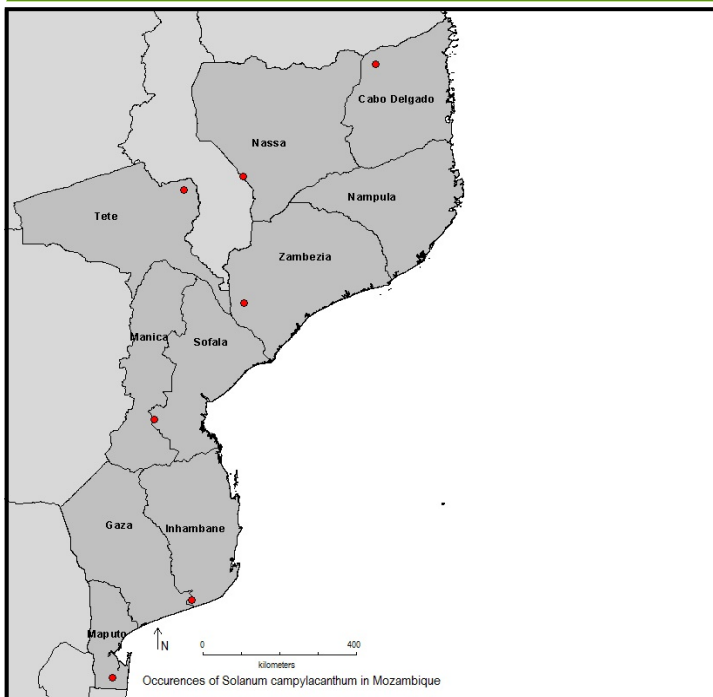
Distribution:

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

Altitude: 0-2300 m

DISTINGUISHING FEATURES OF THIS SPECIES:

<i>Solanum campylacanthum</i>	May be confused with: <i>Other prickly Solanums</i>
Extremely widespread and variable, recognised by mauve flowers, big bright yellow fruits, a long taproot, and leaves that are usually big and entire.	



All populations priority
for collection

No accessions from
Mozambique listed on
Germplasm Resources
Information Network -
(GRIN) [Online Database]
for this taxon

References: *Solanum campylacanthum*. In Solanaceae Source. Downloaded 18th April 2013. <http://www.nhm.ac.uk/research-curation/research/projects/solanaceaesource/taxonomy/description-detail.jsp?spnumber=6805>

Secondary gene pool of Eggplant - *Solanum melongena* L.



0.2-1.5 m



All year

All year

Erect shrub 0.4-1 m, unarmed or with a few spines, sparsely branched, the pubescence fairly uniform across the whole plant.

Leaves simple, the blades 3-8 x 1-3.7 cm, ovate, sometimes oblong, chartaceous.

Inflorescences apparently lateral, 1-2.5 cm long, simple, with 1-4 flowers; peduncle 0-0.2 cm long; rachis 0-1.7 cm long; peduncle and rachis densely pubescent. Flowers apparently all perfect, 5-merous. Calyx 3-5 mm long. Corolla 0.9-1.3 cm in diameter, usually white, sometimes mauve.

Fruit a globose berry, 1-2 per infructescence, 0.75-1.1 cm in diameter, the pericarp thin, stellate-pubescent when young, becoming glabrous when over ca. 5 mm wide, green with dark green or cream blotches or veins when young, orange to red at maturity, drying bright orange, the stigma attachment point a small pale stump.

Seeds numerous, 2.5-2.9 x 1.9-2.5 x ca. 0.5 mm, asymmetrical rounded-reniform, appearing almost orbicular, sometimes deeply curved on both sides of the hilum, thickened at the centre, pale yellow, orange or orange-brown, the surface smooth.

Habitat:

Grassland, savanna or mixed woodland, often near Acacia, on sand or limestone.

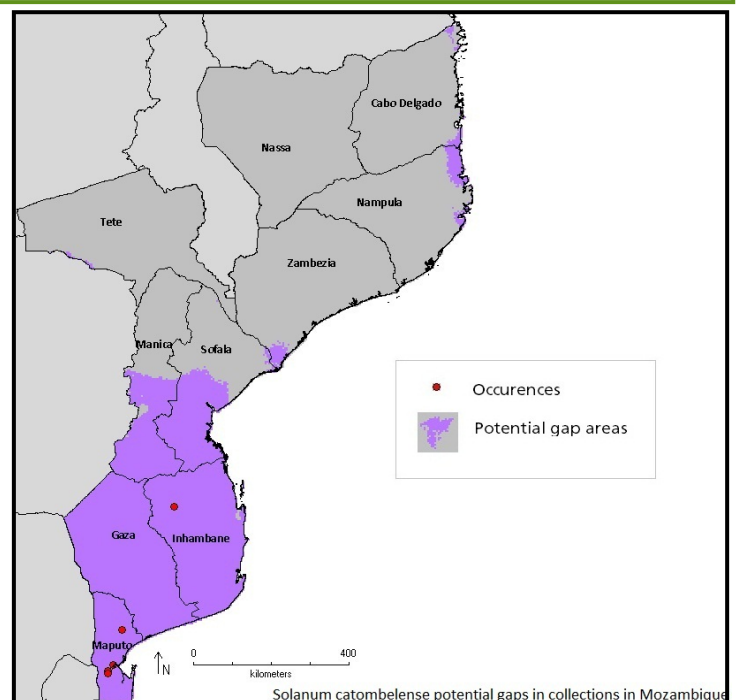
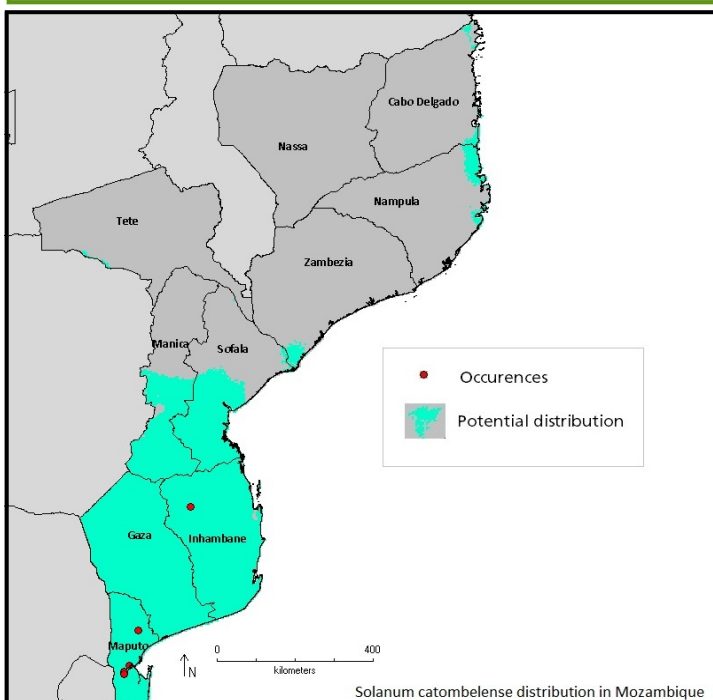
Distribution:

Southern, Middle and Eastern Africa.

Altitude: 0 - 1000 m

DISTINGUISHING FEATURES OF THIS SPECIES:

<i>Solanum catombelense</i>	May be confused with: <i>Solanum litoraneum</i>
Leaves with 2-4 lobes.	Membranous leaves with 1-2 lobes.



References: Vorontsova, M., 2008, *Solanum catombelense*. In Solanaceae Source. Downloaded 20th February 2013
<http://www.nhm.ac.uk/research-curation/research/projects/solanaceaesource/taxonomy/description-detail.jsp?spnumber=1624>

SOLANACEAE

Tertiary gene pool of Eggplant - *Solanum melongena* L.

Solanum catombelense Peyr.

Shintomane; Chintumana



Credit: Warren McClelland



Credit: Raboud University Nijmegen Genebank



Credit: Raboud University Nijmegen Genebank



Credit: Warren McClelland

Gemma Toothill (c) Board of Trustees RBG Kew



Up to 1m



Dec - Apr

Dec - June

Tertiary gene pool of Eggplant - *Solanum melongena* L.

Erect woody perennial herb, 0.5-1 m, heavily armed, branched at the base.

Leaves simple, the blades 10-35 × 6-20 cm, 1.2-2 times longer than wide, elliptic, chartaceous, sparsely to densely stellate-pubescent on both sides.

Inflorescences apparently lateral, extra-axillary, 4-7 cm long, unbranched, with 5-10 flowers. Plants strongly andromonoecious, with one long-styled flower at the base at the base of the inflorescence and all other flowers short-styled, the flowers 5-merous. 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 × ca. 0.3 mm, flattened-reniform, almost round, orange to brown or almost black.

Habitat:

It is 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

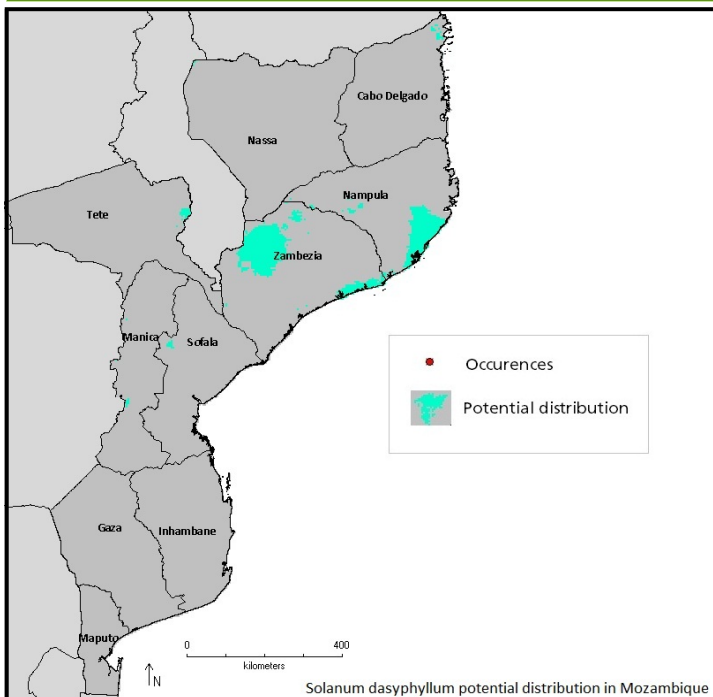
DISTINGUISHING FEATURES OF THIS SPECIES:*Solanum dasyphyllum*

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.



May be confused with: *Other spiny Solanums*

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



All populations priority
for collection

No accessions from
Mozambique listed on
Germplasm Resources
Information Network -
(GRIN) [Online Database]
for this taxon

References: Vorontsova, M, 2009, In Solanaceae Source. Downloaded 20th February 2013 <http://www.nhm.ac.uk/research-curation/research/projects/solanaceaesource/taxonomy/description-detail.jsp?spnumber=2041>; material for seed photo provided by IBPGR.

SOLANACEAE

Solanum dasyphyllum Schumach.

Tertiary gene pool of Eggplant - *Solanum melongena* L.



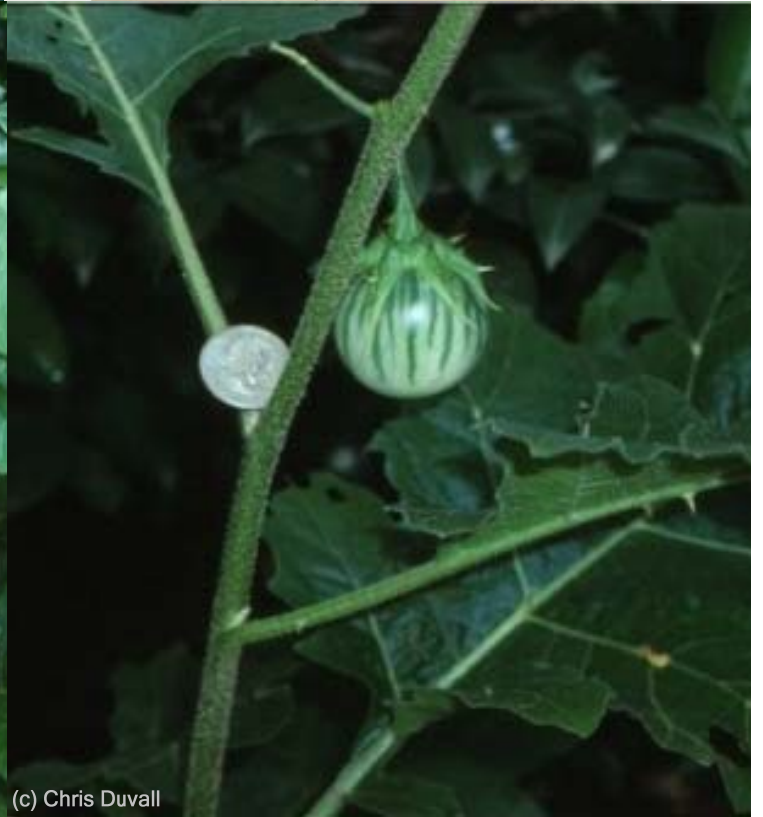
Credit: Raboud University Nijmegen Genebank



Credit: Raboud University Nijmegen Genebank



(c) Chris Duvall



(c) Chris Duvall

Gemma Toothill (c) Board of Trustees RBG Kew



0.5 mm



Up to 1m



All year

All year

HABIT: Often rounded shrub to 1 m, dark green, pubescent with stellate and some simple glandular hairs, the hairs sparse on upper leaf-surface, denser on lower surface; prickles to 15 mm long, common on most parts.

LEAVES elliptic, the lamina mostly 4-8 cm long, 3-6 cm wide, concolorous, deeply lobed; larger lobes sinuate; petiole 1-2 cm long.

INFLORESCENCE short, 3-6-flowered; peduncle absent or short; pedicels 10-15 mm long.

FLOWERS: Calyx 7-8 mm long; lobes lanceolate, 2-4 mm long. Corolla rotate-stellate to pentagonal, 15-20 mm diam., pale purple-blue. Anthers 4.5-6 mm long.

FRUIT: globular, 2-3 cm diam., brown or black. Seeds 2-3 mm long, light brown or mustard coloured.

Habitat:

Forest and woodland, maritime dune vegetation, riverbanks, waste and cultivated grounds, roadsides, in \pm dry or a occasionally moist sites; low altitudes.

Altitude: 0 - 1200 m

Distribution:

Of North African /Mediterranean origin, now widespread, often as a weed of disturbed habitats; recorded also from the Azores and Madeira Is., western Mediterranean region, Canary Is., Angola and South Africa, Madagascar and Mauritius, more recently in Australia, New Caledonia and introduced elsewhere.

DISTINGUISHING FEATURES OF THIS SPECIES:

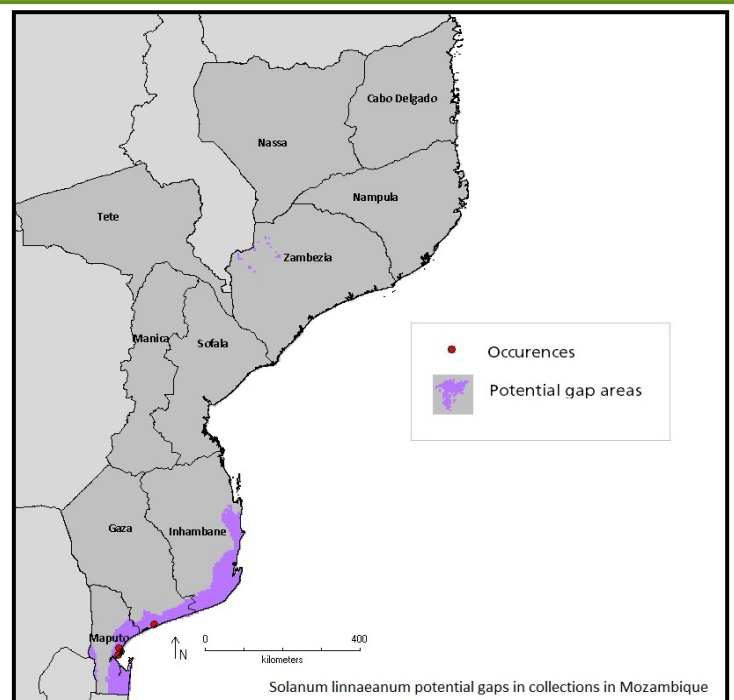
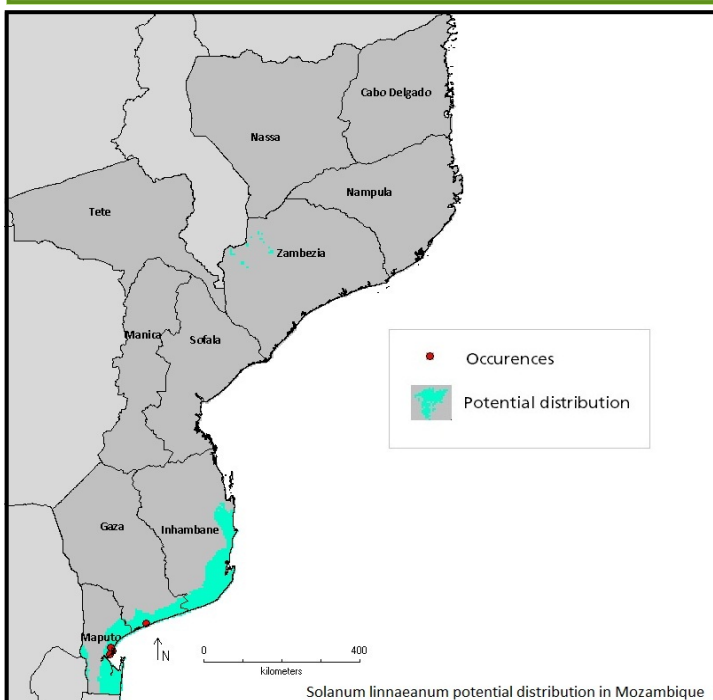
Solanum linnaeanum

Quite deeply incised leaves with rounded lobes.



May be confused with: *Solanum incanum*

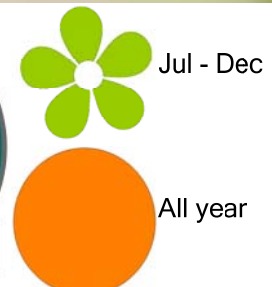
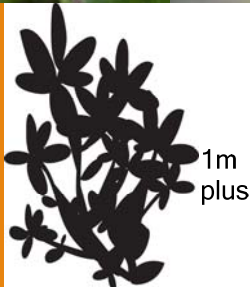
Margins wavy, with more triangular lobes.



References: FZ volume:8 part:4 (2005) Solanaceae by A.E. Gonçalves; PBI Solanum Project. 2012. Solanaceae Source. 20/6/2012. <http://www.nhm.ac.uk/solanaceaesource> ; <http://www.flora.sa.gov.au/> Factsheet: *Solanum linnaeanum*; A new species of *Solanum* (Solanaceae) from South Africa related to the cultivated eggplant, M.S. Vorontsova and S. Knapp, *PhytoKeys*. 2012; (8): 1-11.



No seed
image
available



Tertiary genepool of Eggplant - *Solanum melongena* L.

Erect, scandent or climbing woody perennial shrub, heavily armed, sparsely branched; leaves evenly distributed along the stems.

Leaves simple, the blades 7-22 × 5-13 cm, 1.5-2.5 times longer than wide, ovate to elliptic, chartaceous, moderately to sparsely stellate-pubescent.

Inflorescences apparently terminal or lateral, 6-11 cm long, with 3-10 flowers;

Flowers heterostylous and the plants andromonoecious, with 1-6 long-styled flowers at the base of the inflorescence, the flowers 5-merous. Corolla 3.5-6 cm in diameter, mauve to rich purple, stellate, tearing unevenly at anthesis, opening fully but not reflexed.

Fruit a globose berry, 2-6 per infructescence, 3-5 cm in diameter, elongate during development becoming spherical at maturity, the pericarp thin, smooth, shiny, the young fruit glaucous green with dark green markings, with stellate trichomes scattered around the apex, the mature fruit bright yellow to orange or red-orange, glabrous.

Seeds ca. 200 per berry, 3-4 × 3-3.7 × ca. 0.3 mm, flattened-reniform, somewhat irregular in outline, orange-brown, the surface smooth or with raised outlines of cells or small pits.

Habitat:

It occurs in disturbed areas, open bushland with grass, open forest, thickets and roadsides.

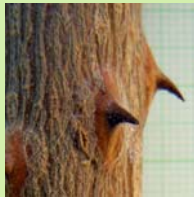
Distribution:

Widespread in East and South-East Africa and Madagascar.

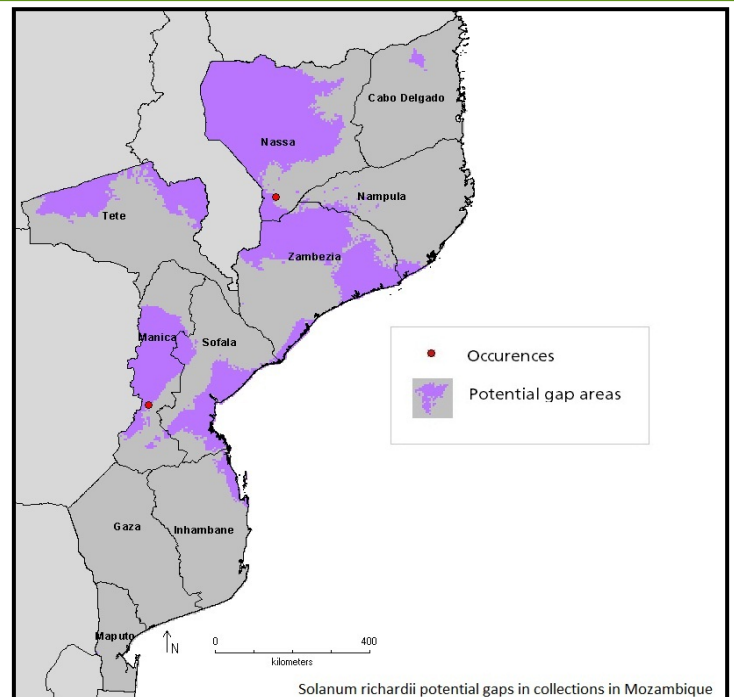
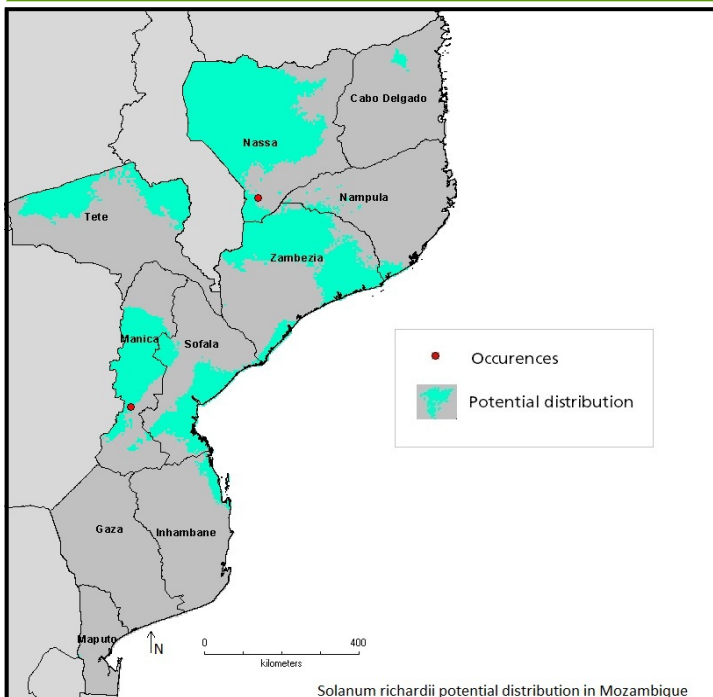
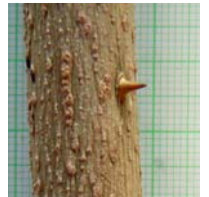
Altitude: 500 - 1300m

DISTINGUISHING FEATURES OF THIS SPECIES:*Solanum richardii*

Corolla 3.5-6 cm in diameter;
prickles usually curved.

May be confused with: *Solanum linnaeanum*

Corolla 1.5-3 cm diameter; prickles straight.

**References:**

Tertiary gene pool of Eggplant - *Solanum melongena* L.



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Credit: Raboud University Nijmegen Genebank



Credit: Raboud University Nijmegen Genebank

No seed
image
available



Up to
2m



All year

Jan - Jun

Wild relative of Eggplant - *Solanum melongena* L.

Impwa

Erect herb to shrub, prickly. Young stems erect, robust, densely stellate-pubescent and prickly, with porrect, variously stalked trichomes; bark of older stems densely stellate-pubescent, yellow-brown. Leaves lobed, the blades 9-15 cm long, 6-12 cm wide, 1.5-2 times longer than wide, ovate, chartaceous, densely stellate-pubescent. Inflorescences apparently terminal or lateral, 3-10.5 cm long, not branched, with 5-8 flowers, densely stellate-pubescent. Flowers 5-merous, heterostylous and the plants andromonoecious, with the lowermost flower long-styled and hermaphrodite, the distal flowers short-styled and staminate. Corolla ca. 3.5 cm in diameter in long-styled flowers, 1.8-2.4 cm in diameter in short-styled flowers, white with purple midveins to mauve, stellate, lobed for 1/4-1/2 of its length. Fruit a spherical berry, 1 per infructescence, 3.2-3.8 cm in diameter, the pericarp smooth, dark green with pale green and cream markings when young, yellow at maturity. Seeds ca. 100-200 per berry, 2.9-3.2 mm long, 2-2.7 mm wide, flattened-reniform, orange-brown.

Habitat:


Edges of roadsides, *Brachystegia* woodland, and grassland.

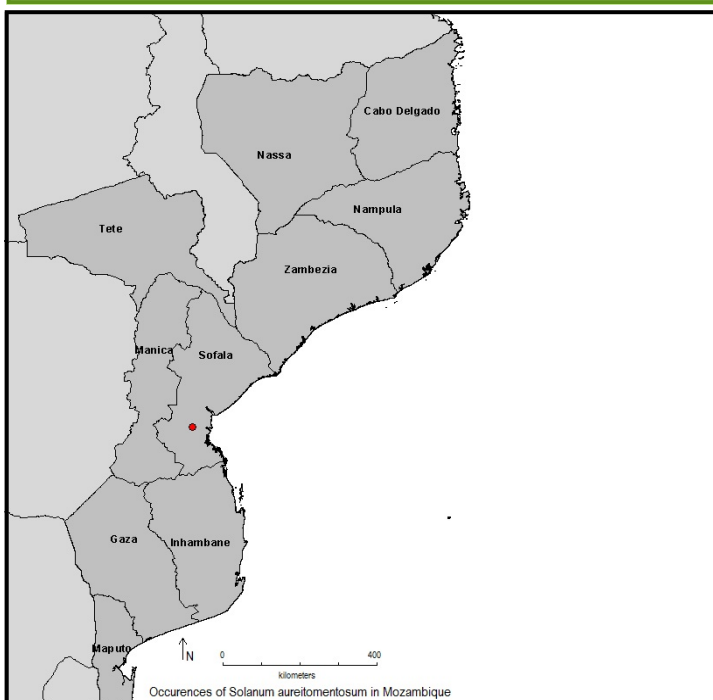
Distribution:

Southern Africa, from Southern Democratic Republic of the Congo to Angola, southern Tanzania, Zambia, and Zimbabwe.

Altitude: 800 - 1600 m

DISTINGUISHING FEATURES OF THIS SPECIES:

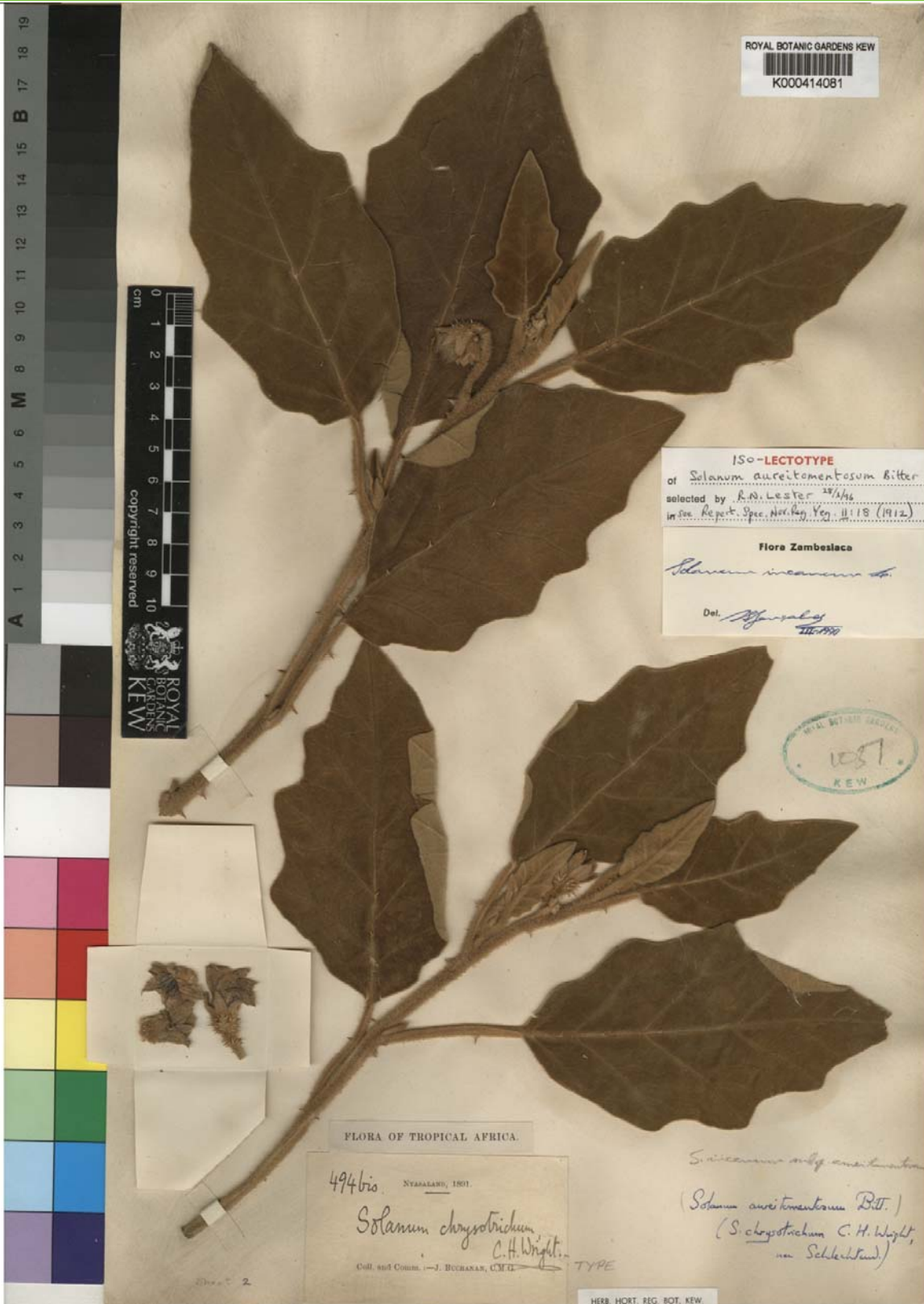
<p><i>Solanum aureitomentosum</i></p> <p>Ovate to oblong, foliaceous, 7-10 mm long calyx lobes on long-styled flowers.</p>	<p>May be confused with: <i>Solanum lichtensteinii</i></p> <p>Long deltoid, appearing less foliaceous, and 3.5-6 mm long calyx lobes on long-styled flowers.</p> 
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All populations priority
for collection

No accessions from
Mozambique listed on
Germplasm Resources
Information Network -
(GRIN) [Online Database]
for this taxon

References: Knapp S, Vorontsova MS, Prohens J (2013) Wild Relatives of the Eggplant (*Solanum melongena* L.: Solanaceae): New Understanding of Species Names in a Complex Group. PLoS ONE 8(2); Vorontsova MS, Knapp S, A REVISION OF THE SPINY SOLANUMS, SOLANUM SUBGENUS LEPTOSTEMONUM (SOLANACEAE) IN AFRICA AND MADAGASCAR, unpublished.



RBG Kew Herbarium specimen

No seed image available

0.5-1.5m

Sep - Jan

Jan - Jul

7

Wild relative of Eggplant - *Solanum melongena* L.

Spreading or occasionally climbing subshrub, armed, sparsely branched; leaves clustered towards the ends of branches or evenly distributed along the stems; leaf scars small stumps, spaced 0.5-1.5 cm apart. Leaves simple, the blades 2-5.5 x 1.5-3.5 cm, 1.5-1.8 times longer than wide, ovate to elliptic, rarely orbicular, sparsely stellate-pubescent to glabrescent on both sides. Inflorescences apparently lateral, ca. 3 cm long, simple or branched, with 2-10(14) flowers; peduncle and rachis densely to sparsely stellate-pubescent like the young stem. Flowers apparently all perfect, 5-merous. Calyx 3-4 mm long, obconical, divided for 1/3-1/2 of its length, the lobes 1.5-2 mm long. Corolla ca. 1.5 cm in diameter, whitish to mauve, stellate?, lobed for ca. 2/3 of its length. Fruit a globose berry, 4-6 per infructescence, 0.9-1.2 cm in diameter, the pericarp thin, smooth, shiny, glabrous, orange to red, the stigma attachment point a small pale stump; fruiting pedicels 10-16 mm long, 0.5-0.8 mm wide at base, woody, pendulous, strongly curved downwards, unarmed or rarely with up to 3 reduced prickles. Seeds numerous, 3-3.5 x 2.2-3 x ca. 0.3 mm, asymmetrical rounded-reniform, pale yellow-orange, the surface smooth, shiny, with raised outlines of cells or small pits.

Habitat:



Occurring on dunes and littoral vegetation, forest edges, sandy soil and bushland.

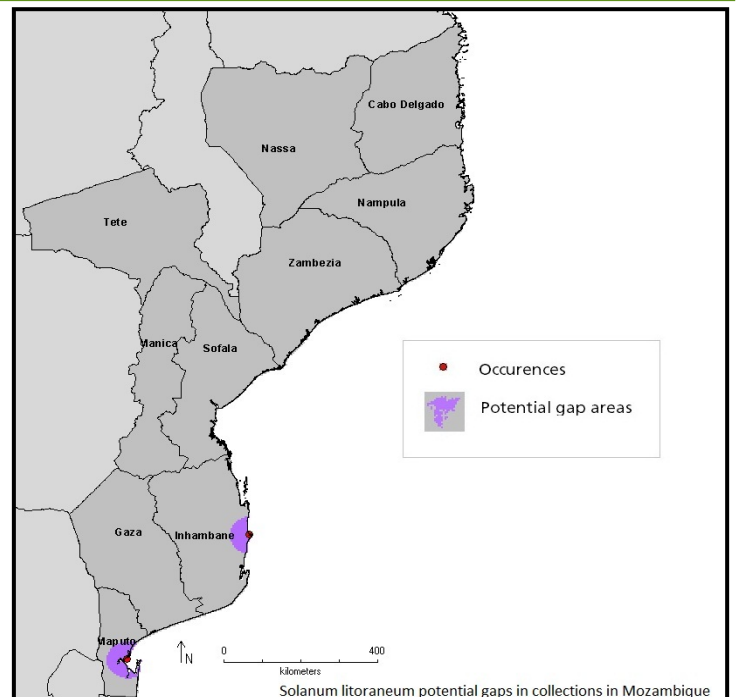
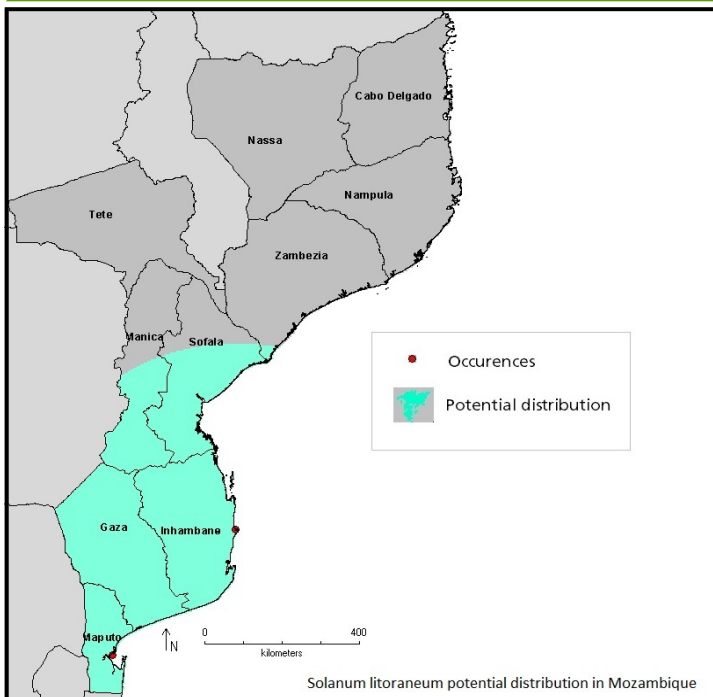
Distribution:

Endemic to southern and southeastern Mozambique.

Altitude: sea level

DISTINGUISHING FEATURES OF THIS SPECIES:

<i>Solanum litoraneum</i>	May be confused with: <i>Solanum rigescens</i>
Recurved prickles; ripe fruit orange to red.	Straight prickles; fruit bright orange.
	




References: Vorontsova, M, 2008, In Solanaceae Source. Downloaded 18th April 2013 <http://www.nhm.ac.uk/research-curation/research/projects/solanaceaesource/taxonomy/description-detail.jsp?spnumber=3506>; Gonçalves, 1997, Two New Species of *Solanum* (Solanaceae) from Mozambique, in *Kew Bull.* 52: 703...


Wild relative of Eggplant - *Solanum melongena* L.




RBG Kew Herbarium specimen


No seed image available





0.2 - 1m





Sept
Sept

Wild relative of Eggplant - *Solanum melongena* L.

Erect or climbing perennial herb to small shrub, armed, moderately branched; bark smooth with fine striations, grey-brown; leaves clustered towards the ends of branches or evenly distributed along the stems; leaf scars small whitish stumps, spaced 0.5-1 cm apart.

Leaves simple, the blades 1-6 x 1-3 cm, ca. 2 times longer than wide, ovate to elliptic, membranous to chartaceous, sparsely stellate-pubescent to glabrous on both sides; petiole 0.2-2.5 cm, 1/3-1/2 of the leaf length, slender, glabrous to sparsely stellate-pubescent like the young stem, unarmed or with 1-2 prickles.

Inflorescences apparently lateral, 2-3 cm long, simple, with 2-8 flowers. Buds ellipsoid.

Flowers apparently all perfect, 5-merous. Calyx 4-5 mm long, cupular to obconical. Corolla 1.5-2.5 cm in diameter, violet to purple or lilac, occasionally white.

Fruit a globose berry, 1-4 per infructescence, 0.8-1.2 cm in diameter, the pericarp thin, smooth, shiny, sometimes with a few scattered trichomes when young, glabrous at maturity, olivaceous or yellowish when young, orange to deep red on maturity, the stigma attachment point a small pale stump.

Seeds numerous, 2.5-3.5 x 2-3 mm, asymmetrical rounded-reniform, pale yellow-orange, the surface smooth, shiny, with raised outlines of cells or small pits.

Habitat:

Occurring in dry Acacia forest, thorn-bush, disturbed vegetation, on sandy or sandy-clay soils.

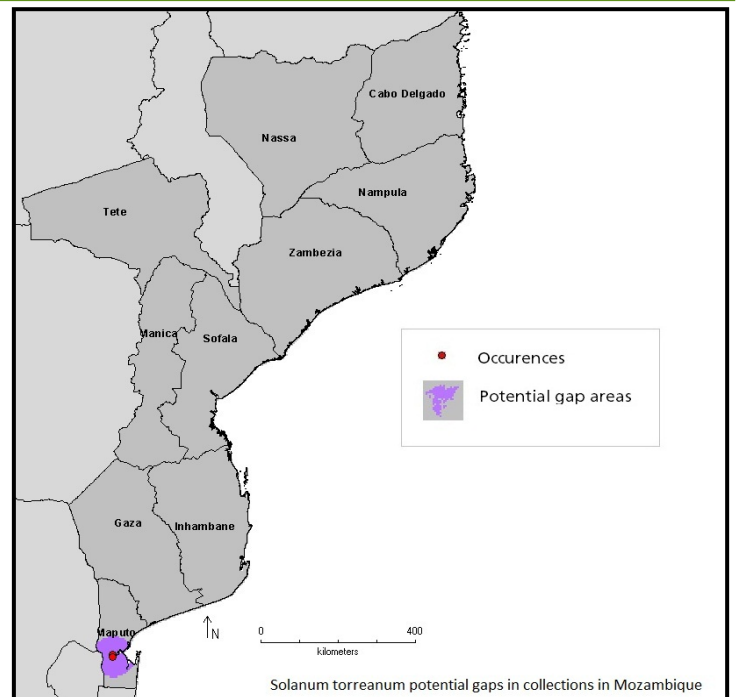
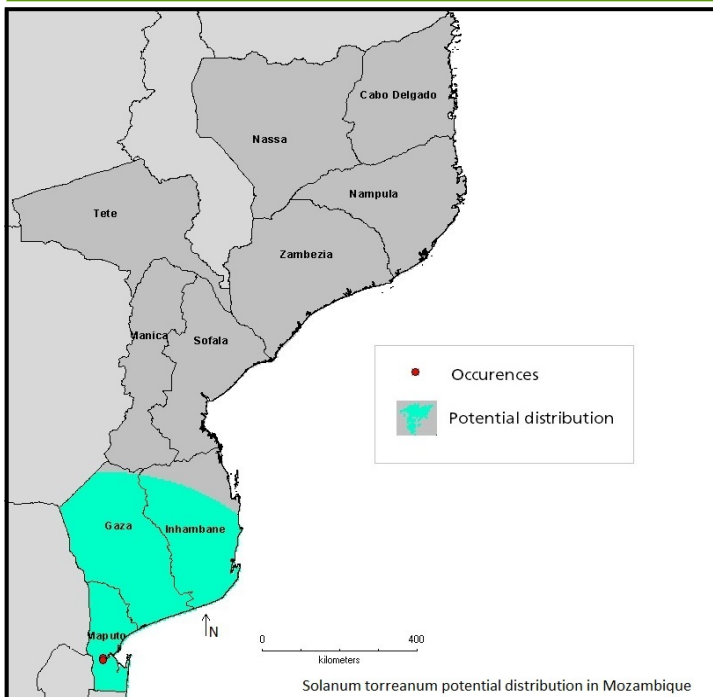
Distribution:

Endemic to lowland southern Mozambique.

Altitude: Low altitudes

DISTINGUISHING FEATURES OF THIS SPECIES:

<i>Solanum torreanum</i>	May be confused with: <i>Solanum capense</i>
Up to 7 flowers in inflorescence.	1-4 flowers in inflorescence.



References: Vorontsova, M, 2008, *Solanum torreanum*. In Solanaceae Source. Downloaded 18th April 2013 <http://www.nhm.ac.uk/research-curation/research/projects/solanaceaesource/taxonomy/description-detail.jsp?spnumber=5807>; A. E. Gonçalves, 1997, Two New Species of *Solanum* (Solanaceae) from Mozambique, Kew Bulletin, Vol. 52, No. 3 (1997), pp. 703-709. Material for seed image...

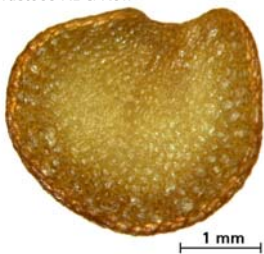
SOLANACEAE

Solanum torreanum A.E. Gonç.

Wild relative of Eggplant - *Solanum melongena* L.



Gemma Toothill (c) Board of Trustees RBG Kew



0.5-1.5 m



All year

All year

Wild relative of Eggplant - *Solanum melongena* L.

Scandent shrub. Young stems ascendent, densely stellate-pubescent and prickly, with porrect, variously stalked trichomes; bark of older stems glabrescent to moderately stellate-pubescent, green-brown to grey-brown. Leaves subentire to weakly lobed, the blades 3-8 cm long, 1.5-4 cm wide, ca. 2 times longer than wide, ovate to elliptic, chartaceous; adaxial surface glaucous or yellow-green, densely stellate-pubescent; abaxial surface green-brown, densely stellate-pubescent.

Inflorescences apparently terminal or lateral, 3-5 cm long, not branched, with 3-10 flowers, densely stellate-pubescent. Flowers (4-)5-merous, apparently all perfect. Calyx 3-9 mm long. Corolla 2.5-3 cm in diameter, mauve to purple, stellate, lobed for ca. 4/5 of its length, the lobes 7-15 mm long, 2-5 mm wide, narrow-ovate to deltoid, spreading, densely stellate-pubescent abaxially.

Fruit a spherical berry, 1-5 per infructescence, 0.8-1.1 cm in diameter, the pericarp smooth, red at maturity; fruiting pedicels 1.2-1.7(2.5) cm long, 0.5-0.8 mm in diameter at base, woody, pendulous, with (0-)5-20 prickles; fruiting calyx not accrescent, covering 1/3-1/2 of the mature fruit, reflexed, with (0-)10-30 prickles. Seeds ca. 10-20 per berry, 2.5-3.5 mm long, 2.5-3 mm wide, flattened-reniform, dull yellow to orange-brown.

Habitat:

Coastal bushland, thickets, savannah and disturbed places.

Distribution:

Southern Kenya to Mozambique.

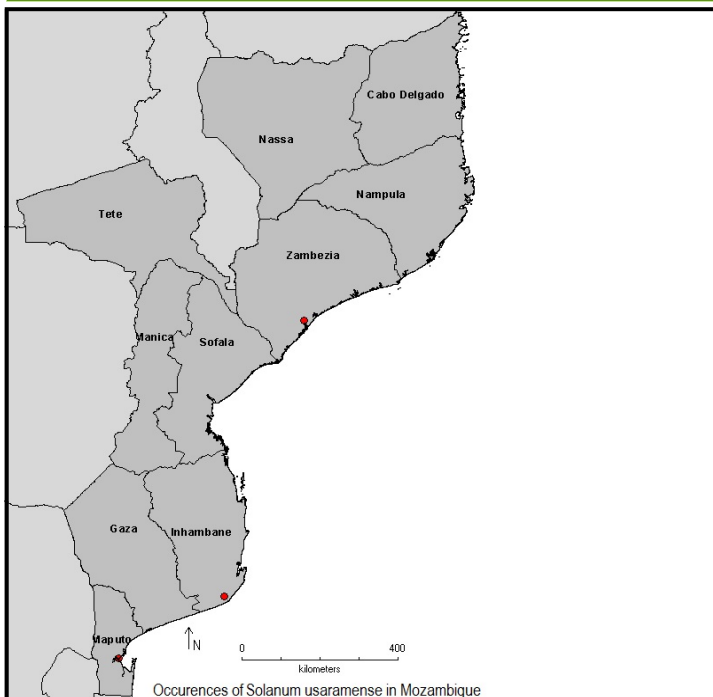
Altitude: 0-500 m

DISTINGUISHING FEATURES OF THIS SPECIES:*Solanum usaramense*

Easily recognised by its dense covering of small uniform hooked prickles, strongly discoloured leaves and fairly big flowers.



May be confused with: *Other spiny Solanums*

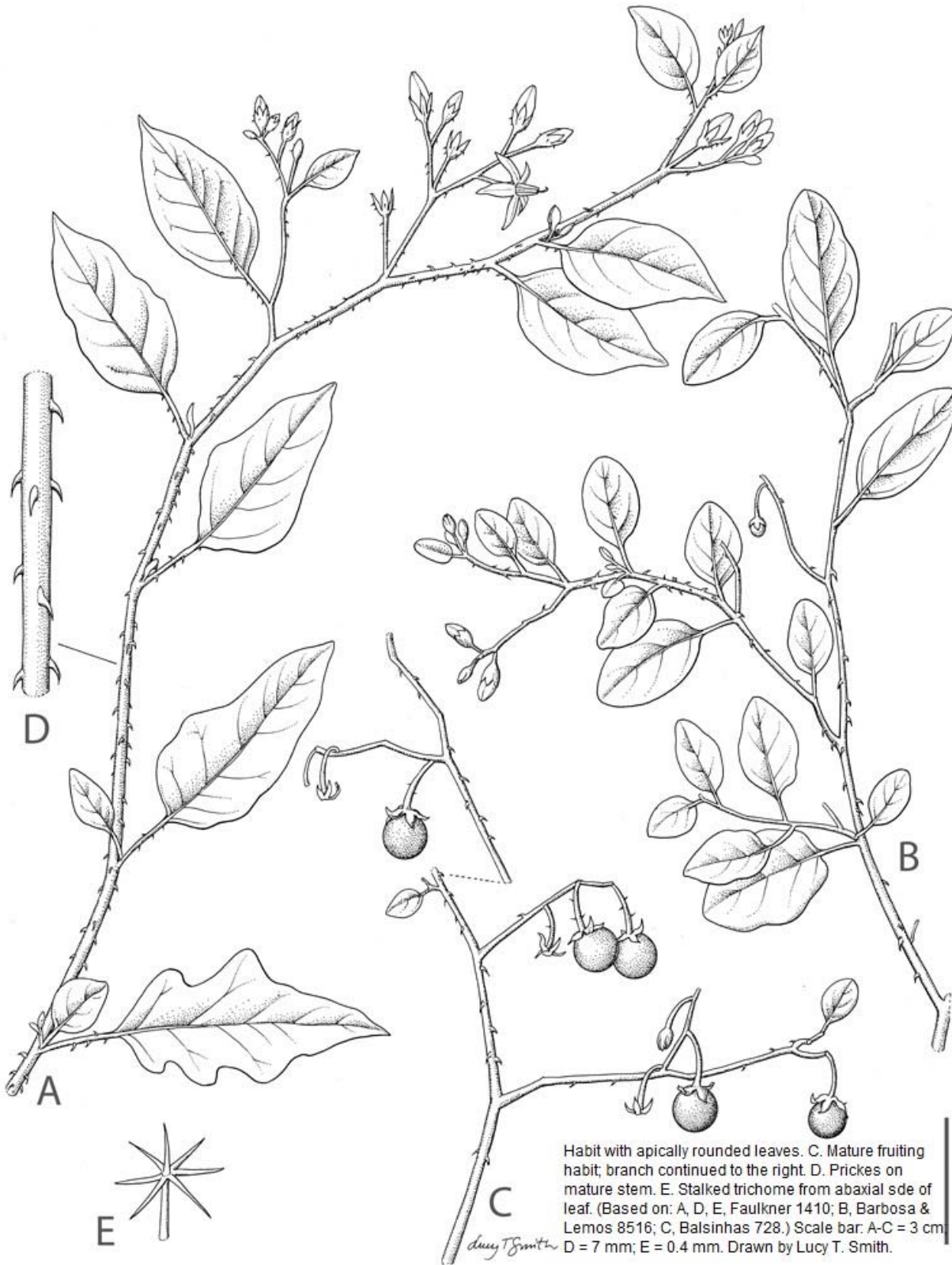


All populations priority
for collection

No accessions from
Mozambique listed on
Germplasm Resources
Information Network -
(GRIN) [Online Database]
for this taxon

References:

Wild relative of Eggplant - *Solanum melongena* L.



Habit with apically rounded leaves. C. Mature fruiting habit; branch continued to the right. D. Prickles on mature stem. E. Stalked trichome from abaxial side of leaf. (Based on: A, D, E, Faulkner 1410; B, Barbosa & Lemos 8516; C, Balsinhas 728.) Scale bar: A-C = 3 cm; D = 7 mm; E = 0.4 mm. Drawn by Lucy T. Smith.

Credit: Lucy T Smith

<p>No seed image available</p>		<p>2 m</p>			<p>Jan - Aug</p> <p>Jan - Aug</p>
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Wild relative of Eggplant - *Solanum melongena* L.

Erect to climbing woody herb or shrub, armed, sparsely branched; young stems long, slender, ascendant, flattened to terete, stellate-pubescent; bark smooth, grey to brown; leaves evenly distributed along the stems; leaf scars obscure. Leaves simple, the blades 3-14 × 1.5-7.5 cm, 2.5-3 times longer than wide, ovate to lanceolate, membranous to chartaceous, stellate-pubescent to glabrescent on both sides.

Inflorescences apparently lateral, sometimes terminal, 2-5 cm long, not branched, with 2-10 flowers. Buds ovoid, the calyx shorter than the corolla.

Flowers apparently all perfect, 4- or 5-merous. Calyx 2-4 mm long, cupular, divided for 1/3-1/2 of its length. Corolla 1.5-2 cm in diameter, white to pale mauve or purple, stellate, lobed for ca. 5/6 of its length.

Fruit a globose or slightly elongated berry, 1-4(10) per infructescence, 8-14 mm in diameter, the pericarp thin, smooth, shiny, glabrous, green when young, bright red to orange-red at maturity, the stigma attachment point a small stump. Seeds ca. 15-30 per berry, 1.8-2.5 × 1.5-2.3 × ca. 0.3 mm, flattened-reniform, white-yellow to yellow-orange or dull-orange, the surface shiny, minutely reticulate or with raised outlines of cells or small pits.

Habitat:

Wet or dry forest undergrowth, forest edges, and rocky outcrops on sand or sandy loam.

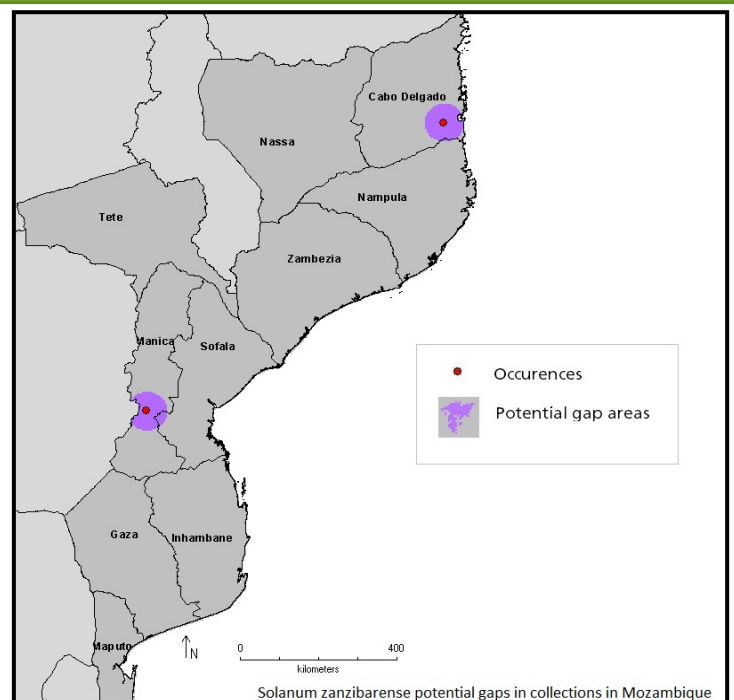
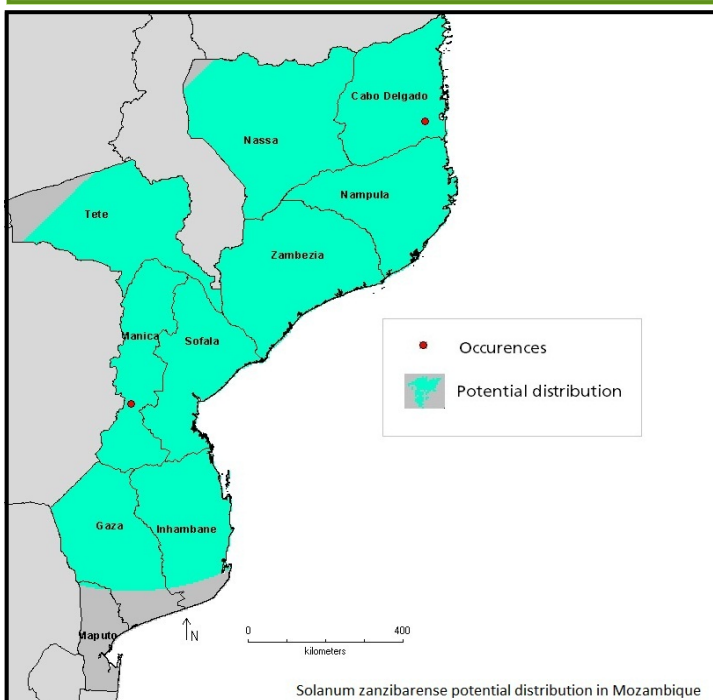
Distribution:

Coastal areas of southern Kenya (Coast Province), Tanzania (Tanga Province, Eastern Province, Southern Province, Zanzibar, Pemba), and Mozambique.

Altitude: 0-700m

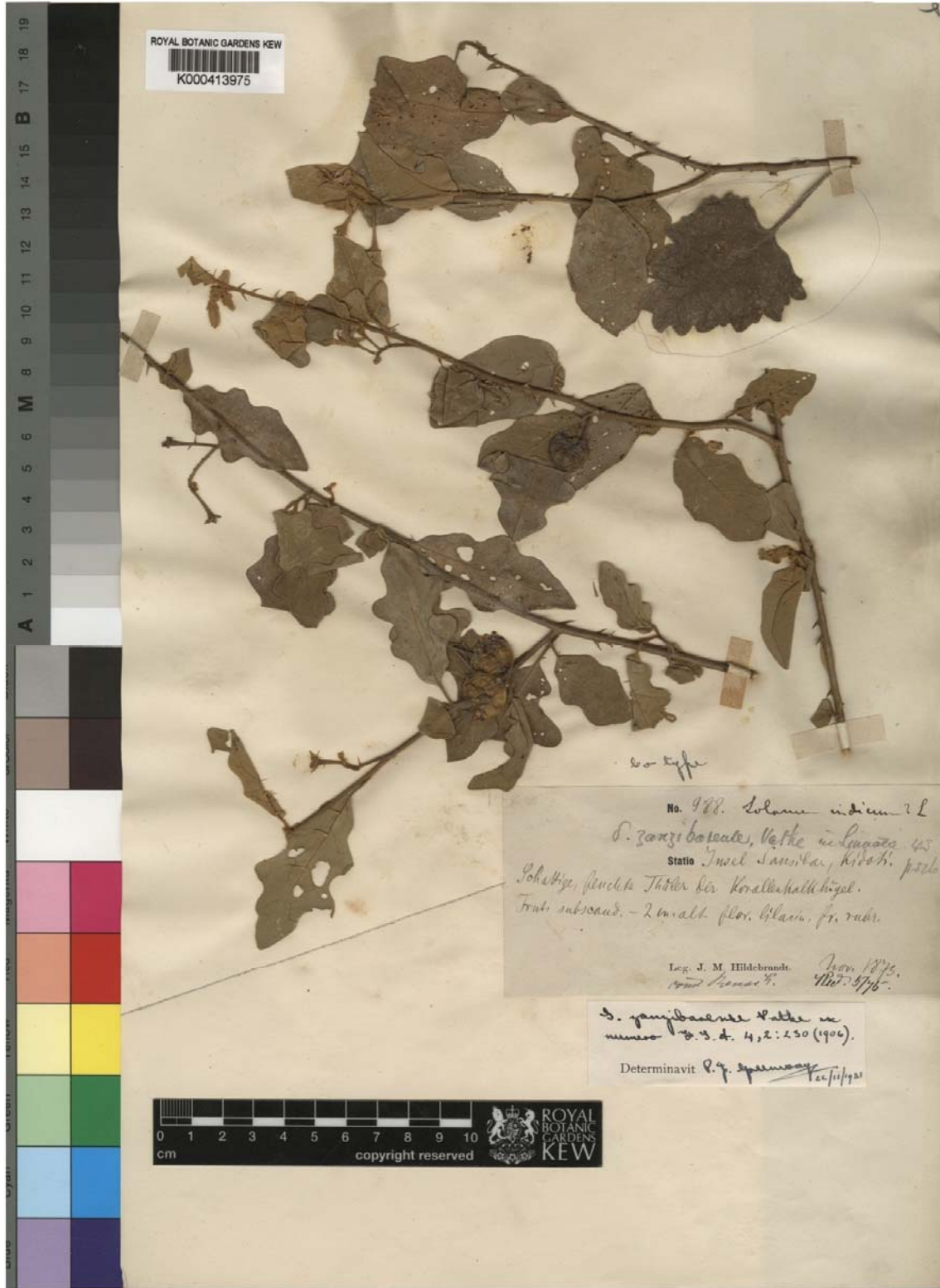
DISTINGUISHING FEATURES OF THIS SPECIES:

<i>Solanum zanzibarense</i>	May be confused with: <i>Solanum usaramense</i>
Corolla 1.5-2 cm in diameter.	Corolla 2.5-3 cm in diameter.




References:


Wild relative of Eggplant - *Solanum melongena* L.




RBG Kew Herbarium specimen


No seed
image
available







4 m







Mar - Jun



All year

11

Caespitose annual.

Culms robust, up to 100 cm tall, erect or geniculately ascending, often branching from the lower nodes.

Ligule with a definite ciliate fringe.

Leaf laminas 5-35 cm × 3-6 mm, usually folded.

Racemes 3-17, 3.5-15.5 cm × 4-7 mm. Spikelets 4.6-7.8 mm long, elliptic; glumes acute, the inferior 2-3.2(3.9) mm long, often 2-3-nerved, the superior 3-4.7 mm long; lemmas 3.7-4.9 mm long, lanceolate in profile, acute to subacute. 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: 0 - 1910 m

DISTINGUISHING FEATURES OF THIS SPECIES:

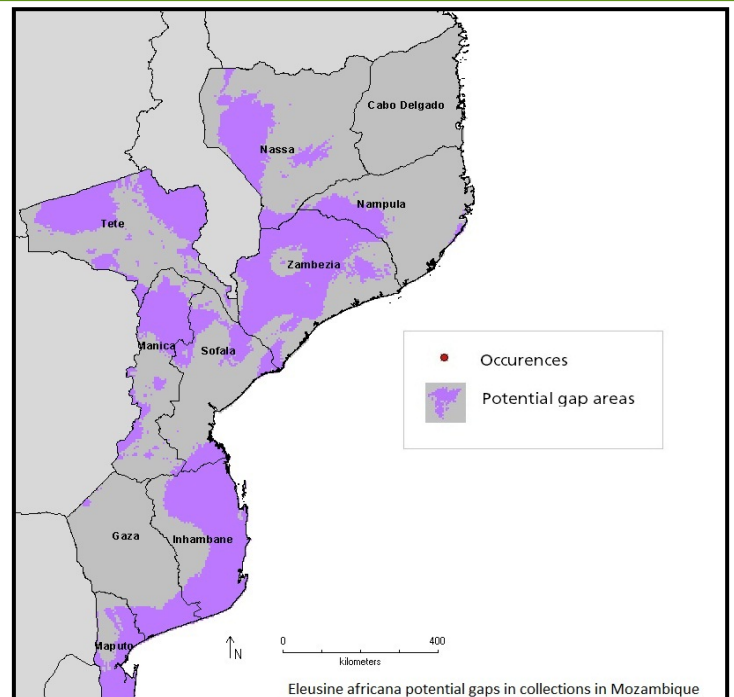
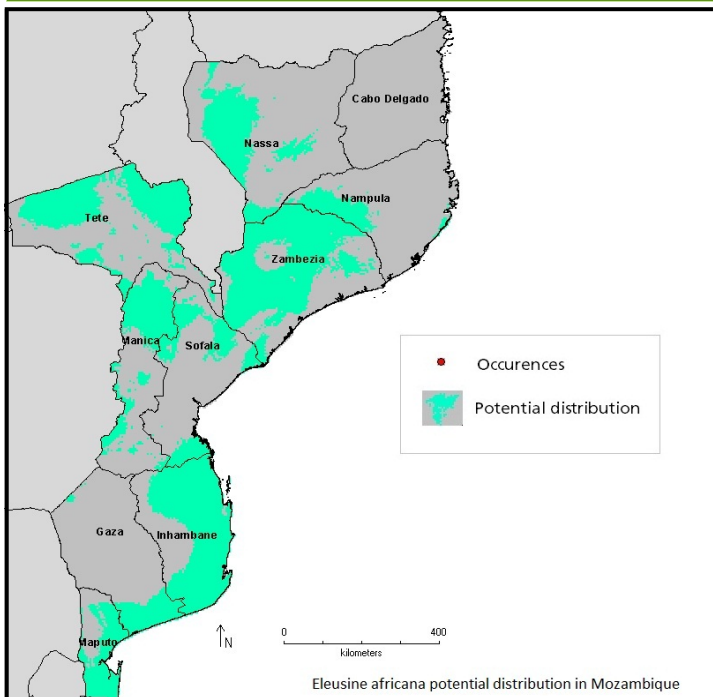
Eleusine africana

Larger spikelets (4.6 - 7.8 mm) and rounded grains.



May be confused with: *Eleusine indica*

Smaller spikelets (3-5mm), oblong grains.



References: FZ volume:10 part:2 (1999) Gramineae by T. Cope; FAO Grassland Index; Hyde, M.A., Wursten, B.T. & Ballings, P. (2012). Flora of Zimbabwe: Species information: *Eleusine africana*.



Credit: RBGKew



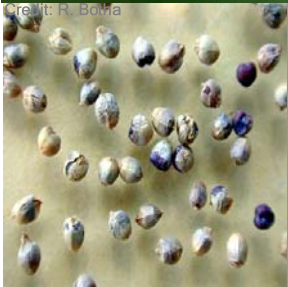
Credit: Petra Ballings



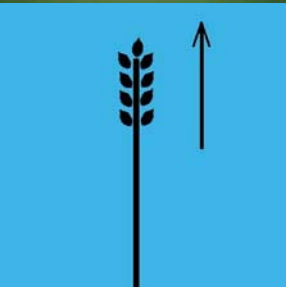
Credit: Petra Ballings



Credit: RBGKew



Credit: R. Boma





Relative of Finger millet - *Eleusine coracana* (L.) Gaertn.**HABIT** Annual; caespitose. Culms geniculately ascending, or decumbent; slender; 15-85 cm long.**LEAVES** mostly basal. Leaf-sheaths keeled; outer margin hairy. Leaf-blades conduplicate; 5-35 cm long; 2.5-6 mm wide. **INFLORESCENCE** composed of racemes. Racemes 1-10(-17); single (rarely), or digitate; unilateral; 3.5-15.5 cm long; 3-3.5 mm wide.**FERTILE 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.**FLORETS** Fertile lemma lanceolate in profile; 2.1-3.6 mm long; membranous; 3 -veined (excluding subsidiaries).**FLOWER** Lodicules 2; cuneate; fleshy.**FRUIT** Caryopsis with free soft pericarp; ellipsoid; isodiametric; trigonous; concealed by floret; 1-1.3 mm long; black; striate.**Habitat:**

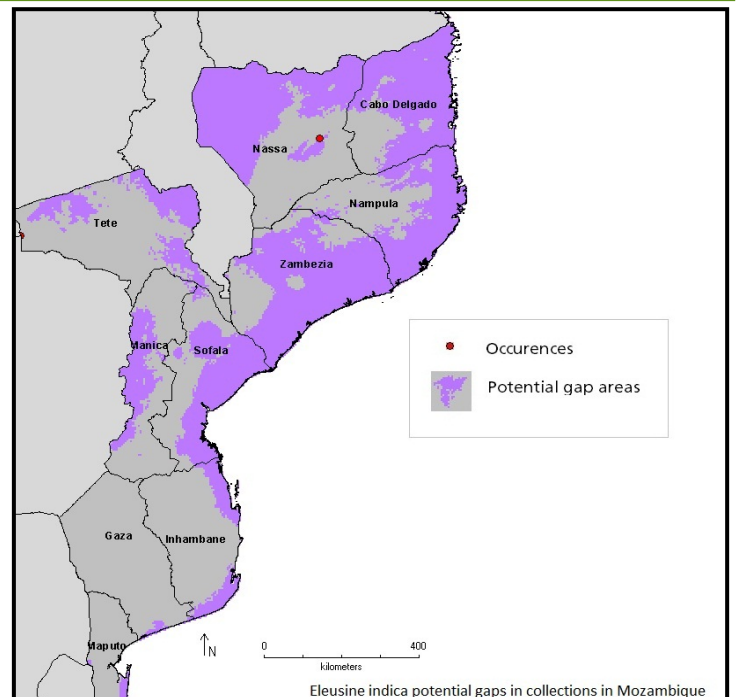
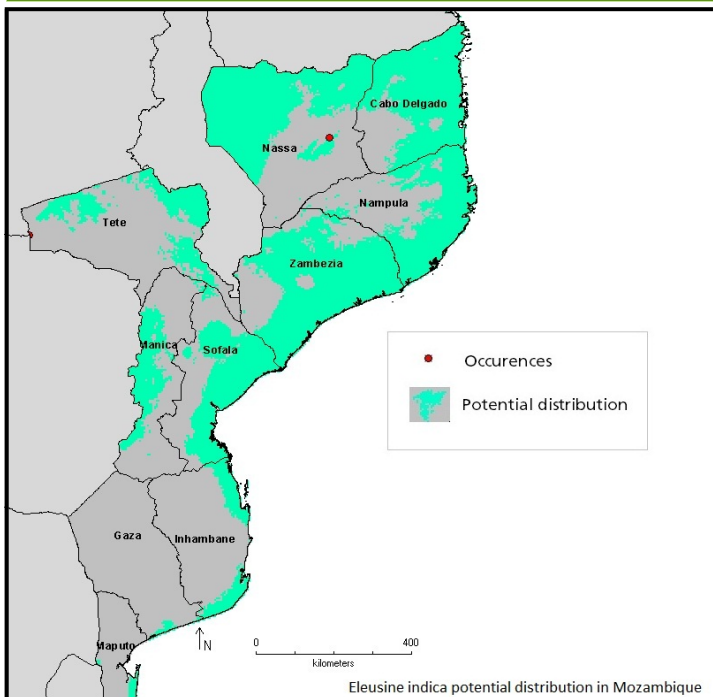
Found in moist as well as marshy areas, puddles, shallow ponds, fields, river and stream edges, ditches, canals etc.

Distribution:

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

Altitude: 0 - 2000 m**DISTINGUISHING FEATURES OF THIS SPECIES:**

<p><i>Eleusine indica</i></p> <p>Smaller spikelets (3-5mm), oblong grains.</p> 	<p>May be confused with: <i>Eleusine africana</i></p> <p>Larger spikelets (4.6 - 7.8 mm) and rounded grains.</p> 
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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>. [accessed 18th April 2013; 12:15 GMT]

Relative of Finger millet - *Eleusine coracana* (L.) Gaertn.



USDA-NRCS PLANTS Database / Hitchcock, A.S. (rev. A. Chase). 1950



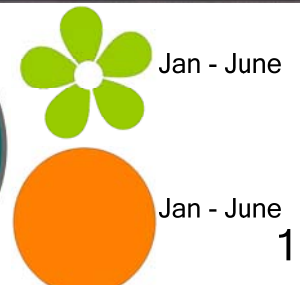
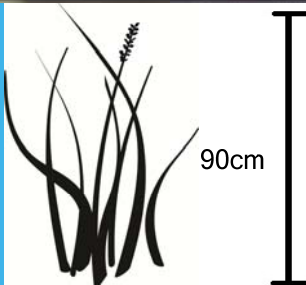
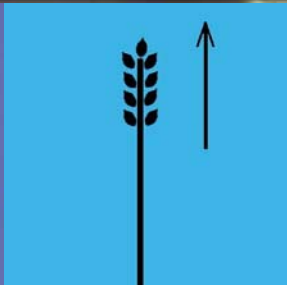
Credit: Frances Cook/RBGKew



Credit: Harry Rose



Credit: Harry Rose



Genepool 2 of Pearl millet - *Pennisetum glaucum* (L.) R. Br.

Elephant grass, Napier grass

Robust perennial forming large, bamboo-like clumps, with culms usually 2-3.5 m high (up to 7.5 m) and branched towards the top.

Stem to 3 cm diameter near the base.

Leaf blades glabrous or hairy, 30-120 cm long and 1-5 cm wide; leaf-sheaths glabrous or with stiff hairs.

Spreads by short rhizomes, rooting from lower nodes or falling stems rooting at nodes creating a stolon.

Inflorescence a bristly false spike 10-30 cm long, 1.5-3 cm wide (excluding bristles) dense, usually yellow-brown in colour, more rarely greenish or purplish. Extensive root system penetrating to 4.5 m.

Habitat:

Riverine sites, valley bottoms and forest margins, with a preference for rich soils.

Distribution:

Tropical Africa; introduced to most other tropical countries.

Altitude: 300 - 1800 m

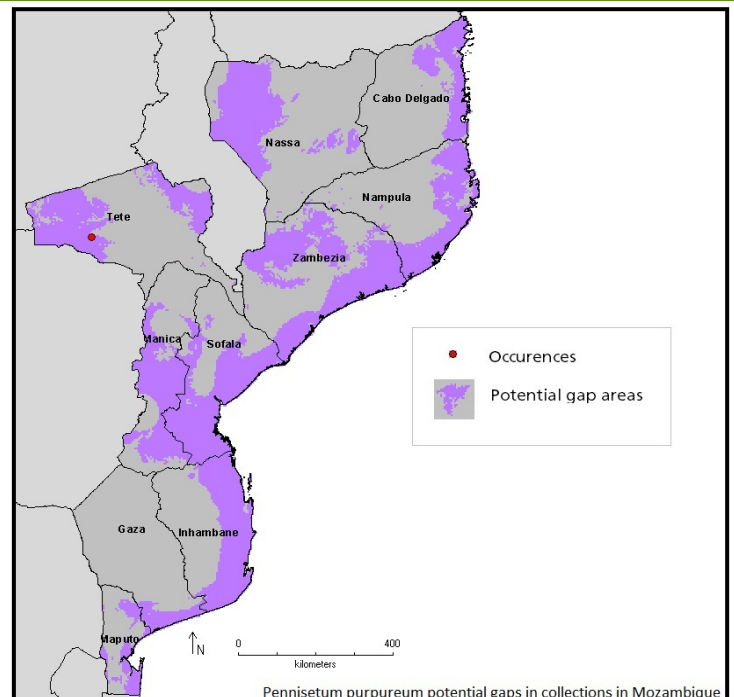
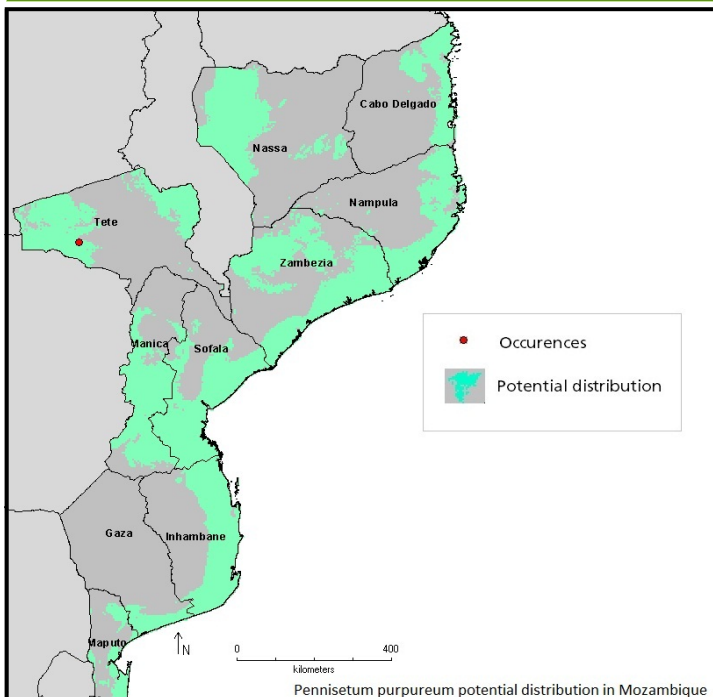
DISTINGUISHING FEATURES OF THIS SPECIES:*Pennisetum purpureum*

Bristles are shed with the seeds.



May be confused with: *Setaria* spp.

Seeds are shed without bristles.



References: FZ volume:10 part:3 (1989) Gramineae by W. D. Clayton; Cook, B.G., Pengelly, B.C., Brown, S.D., Donnelly, J.L., Eagles, D.A., Franco, M.A., Hanson, J., Mullen, B.F., Partridge, I.J., Peters, M. and Schultze-Kraft, R. 2005. Tropical Forages: an interactive selection tool., [online], CSIRO, DPI&F(Qld), CIAT and ILRI, Brisbane, Australia. Identification and Biology of Non-Native Plants in...



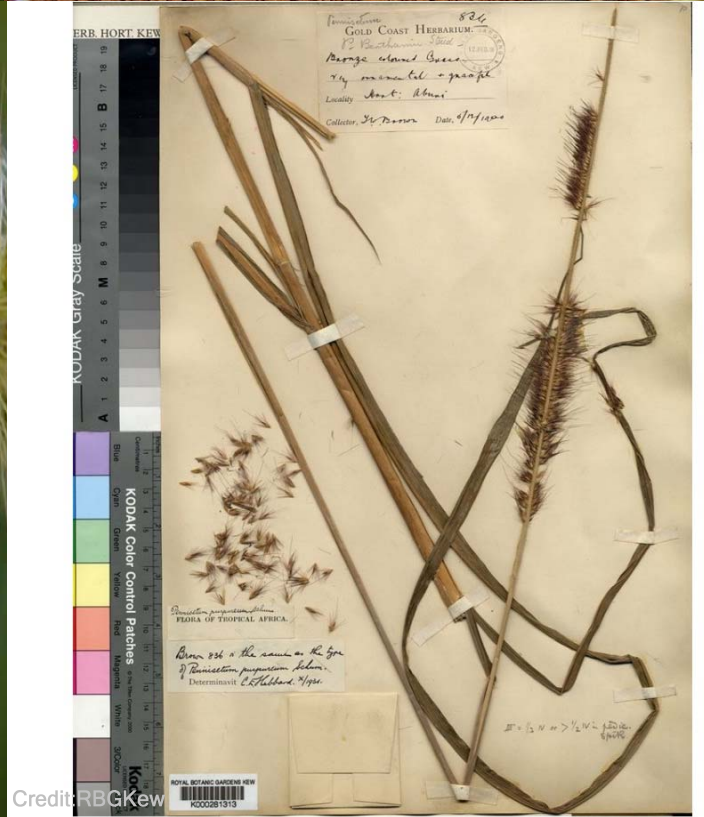
Credit: Forest & Kim Starr



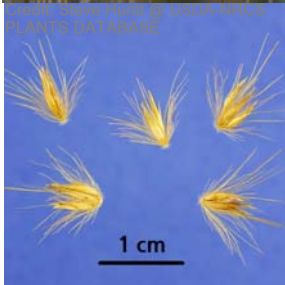
Credit: Forest & Kim Starr



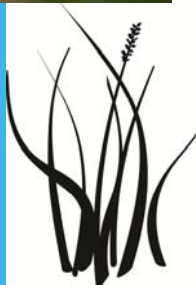
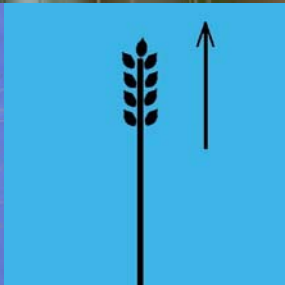
Credit: Forest & Kim Starr



Credit: RBG Kew



Credit: Steve Hurst @ USDA-NRCS PLANTS DATABASE



1-6 m



Jan - June

Jan - June

Annual, rarely short-lived perennial; culms 30–400 cm high, robust, branched; nodes mostly glabrous, sometimes pubescent; leaf sheaths glabrous; ligule a membrane, edged with a fringe of fine hairs and hairy on the back; leaf laminae variable, often large, 5–75 cm × 5–7 mm, broadly lanceolate, flat, glabrous on both surfaces, with a prominent whitish midrib. Panicle 10–60 cm long, broadly spreading; main axis angular, glabrous; primary branches divided, pubescent at the nodes; racemes 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, the keels winged, the wings not or scarcely broadened above and ending in minute teeth well below the glume apex, the latter not equally 3-toothed, white-pubescent, sometimes tomentose or fulvously pubescent, slightly depressed longitudinally on the back; 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, awned; awn up to 20 mm long, 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.

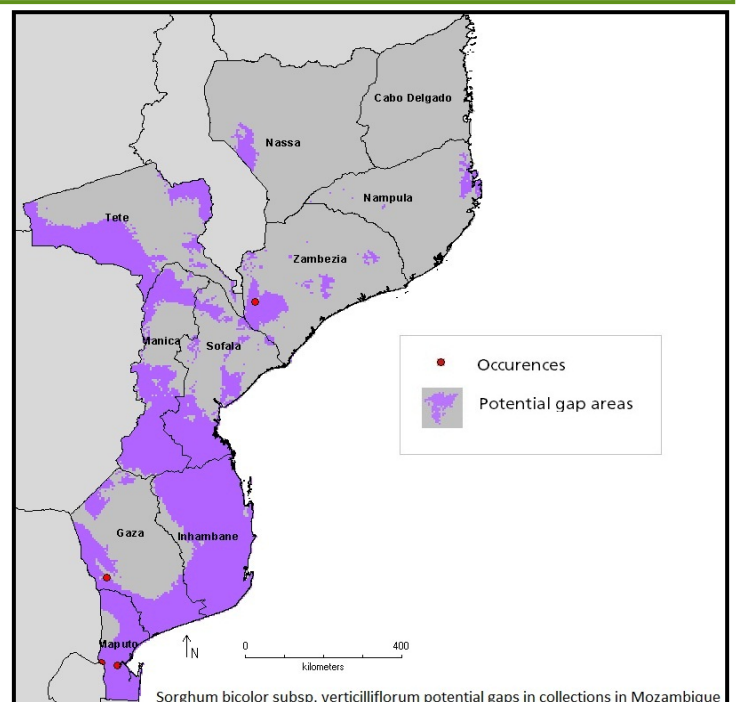
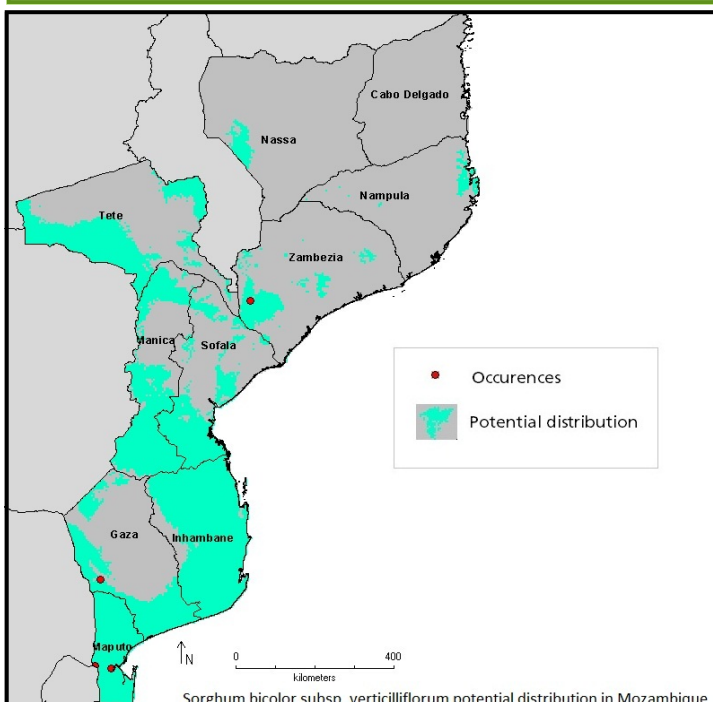
Distribution:

Native to Africa, Madagascar, and perhaps to the Mascarenes, but also introduced to India, Australia, and the Americas.

Altitude: 50 - 1400 m

DISTINGUISHING FEATURES OF THIS SPECIES:

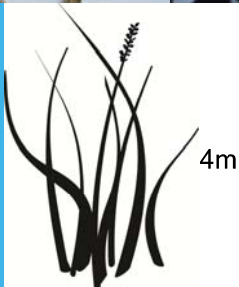
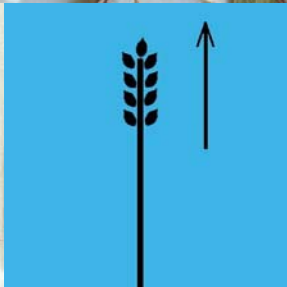
<i>Sorghum bicolor subsp. verticilliflorum</i>	May be confused with: <i>Sorghum bicolor subsp. drumondii</i>
Leaf blades linear lanceolate, up to 75 x 7cm, panicle up to 60 cm long x 25 cm wide.	Leaf blades lanceolate 50 x 6 cm, panicles 30 cm long x 15 cm wide.

**References:**

Sorghum bicolor subsp. verticilliflorum (Steud.) de Wet

Gene Pool Primary relative of *Sorghum bicolor subsp. bicolor*

Common wild Sorghum



LC
PRELIM

Dec - July

Dec - July

15

Secondary relative of Rice - *Oryza glaberrima* and *Oryza sativa*

Culms 50-120(-150) cm. tall, 3-5-noded. Leaf-sheaths scarious, often spongy and aerenchymatous, distinctly striate. Ligule 3-10 mm. Leaf-laminae 15-45 x 0.5-2.5 cm., linear to very narrowly elliptic, acuminate, usually broadest around the middle, pale-green or rarely glaucous, rather flaccid, expanded or folded around the midrib; midrib distinct beneath. Panicle 15-35 x 3-17 cm., narrowly to broadly elliptic or sometimes fan-shaped in outline, loose, erect, or drooping; rhachis obtusely angular; solitary or sometimes adnate, angular, scabrous; pedicels 2-5 mm. long. Spikelets (5)5.5-6.25 + (2)2.25-2.8 mm. (the length usually 2.5 times the width), deciduous, asymmetrically elliptic-oblong or broadly oblong in lateral view, greyish-green or glaucous. Glumes reduced to a membranous whitish narrow rim. Sterile lemmas about equal in shape and size, 1-1.5 mm. long, lanceolate to lanceolate-deltate, acuminate, glabrous. Fertile lemmas slightly shorter than the spikelet, cymbiform, semi-elliptic-oblong in lateral view, coriaceous; flanks finely tessellate, shortly but stiffly hispid or very rarely glabrous; keel and margins stiffly ciliate, lateral apical protrusions almost always distinct; awn (1)2-7.5 cm. long, very slender, flexuous, scaberulous, pale yellow. Palea slightly shorter than the lemma and much narrower. Anthers oblong, pale-violet. Stigmas blackish. Caryopsis 4-4.75 x 1.5-1.75 mm., oblong, glabrous, light brown.

Habitat:

Semi-open or shaded habitats of forest margins and forests. Swampy areas, around water holes and pools, and flooding riverbanks. Clay or sandy soil.

Distribution:

East, Central, West and Southern Africa.

Altitude: unknown

DISTINGUISHING FEATURES OF THIS SPECIES:

<i>Oryza schweinfurthiana</i>	May be confused with: <i>Oryza punctata</i>
O. schweinfurthiana may be considered a tetraploid form of O. punctata	

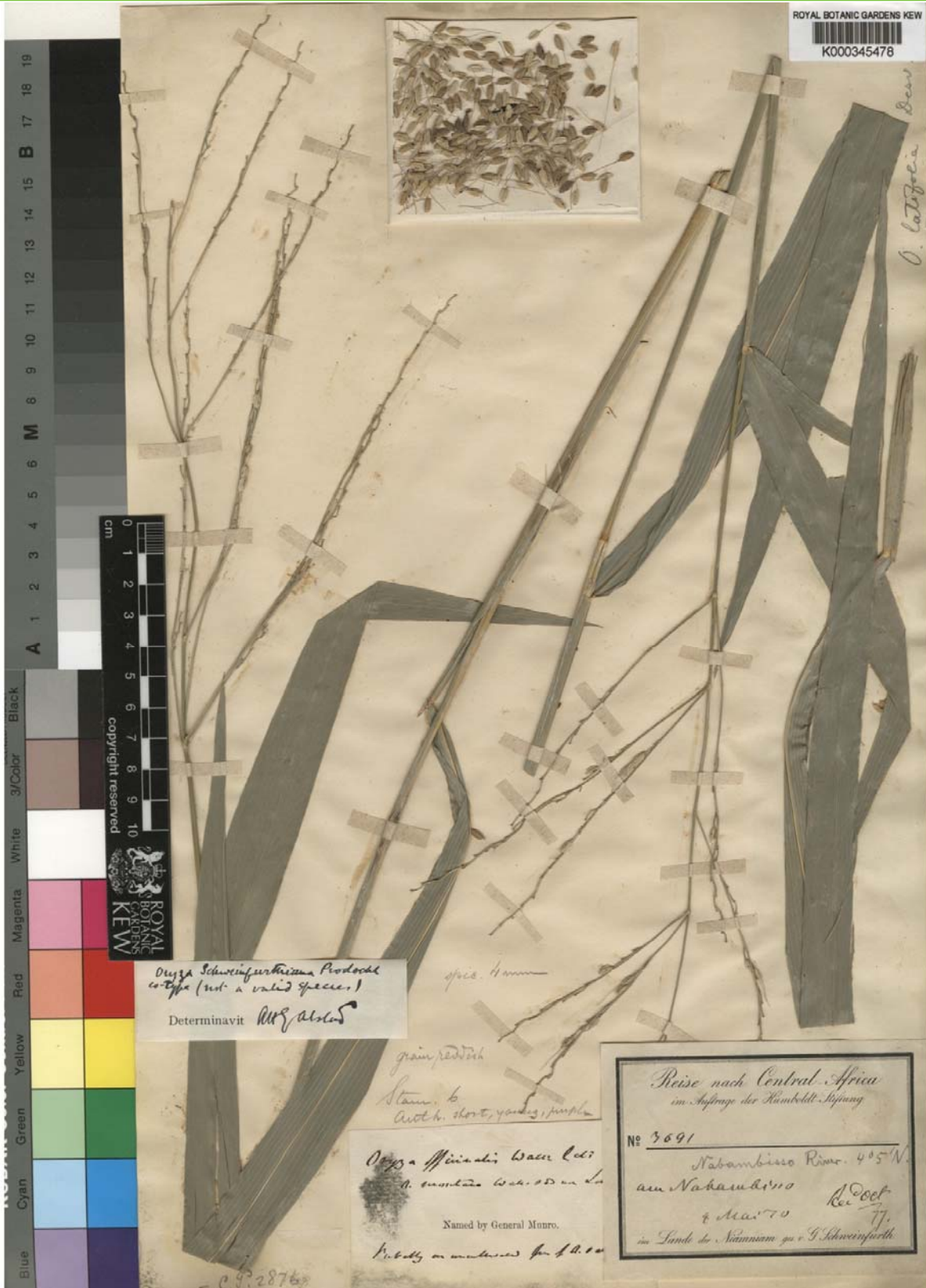
Reported from Mozambique, but no localities known.

All populations priority for collection

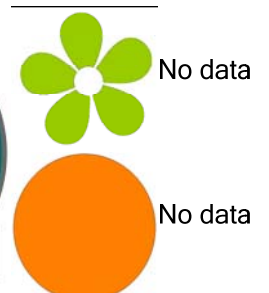
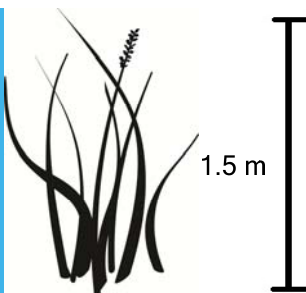
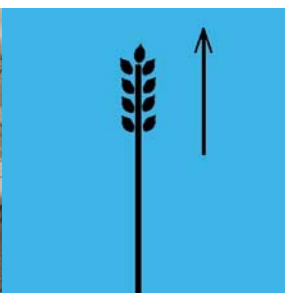
No accessions from Mozambique listed on Germplasm Resources Information Network - (GRIN) [Online Database] for this taxon

References: IRRI Rice Knowledge Bank <http://www.knowledgebank.irri.org>

Secondary relative of Rice - *Oryza glaberrima* and *Oryza sativa*



RBG Kew herbarium specimen



Tertiary genepool of Eggplant - *Solanum melongena*

Erect herb to shrub, 0.5-2 m, prickly. Young stems erect, with raised longitudinal ridges, densely stellate-pubescent and prickly; bark of older stems densely, sometimes moderately stellate-pubescent, grey. Leaves lobed, the blades 8-27 cm long, 3-20 cm wide, 1.5-2.5 times longer than wide, ovate, chartaceous; adaxial surface dirty green-brown, densely stellate-pubescent; abaxial surface whitish, densely stellate-pubescent; the primary veins 5-7 pairs; base cordate, sometimes cuneate, the lobes 3-5 on each side, 0.5-3 cm long, extending 1/4-1/3(-1/2) of the distance to the midvein; petiole 2-7 cm long. Inflorescences 3-8 cm long, with 5-10 flowers, densely stellate-pubescent. Flowers (4-)5-merous, heterostylous and the plants andromonoecious, with the lowermost flower long-styled and hermaphrodite, the distal flowers short-styled and staminate. Calyx 7-15 mm long in long-styled flowers, 4.5-9 mm long in short-styled flowers. Corolla 2.5-3.5 cm in diameter in long-styled flowers, 1.5-2.6 cm in diameter in short-styled flowers, white to mauve, stellate, lobed for 1/4-1/2 of its length. Fruit a spherical berry, 1 per infructescence, 2.5-4.5 cm diameter, the pericarp smooth, dark green with pale green and cream markings when young, bright yellow at maturity; fruiting pedicels woody, pendulous, with 3-10 prickles; fruiting calyx elongating to 12-19 mm long, covering ca. 1/6 of the mature fruit, reflexed, with 5-50 prickles. Seeds ca. 100-200 per berry, 2.2-3.2 mm long, 2.2-2.5 mm wide, flattened-reniform, dull yellow to orange-brown.

Habitat:

Dry grassland, woodland, and thickets.

Distribution:

Known from Southern Africa.

Altitude: 500 - 2000 m

DISTINGUISHING FEATURES OF THIS SPECIES:

<i>Solanum lichtensteinii</i>	May be confused with: <i>Other African spiny Solanums</i>
Fruits up to 4.5 cm in diameter, the largest of all African spiny <i>Solanums</i> .	Smaller fruit.

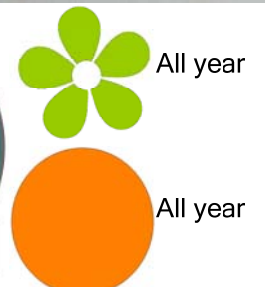
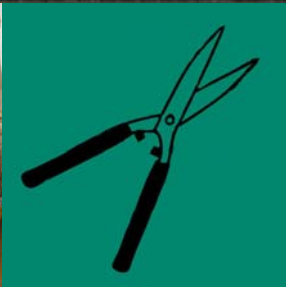


All populations priority
for collection

No accessions from
Mozambique listed on
Germplasm Resources
Information Network -
(GRIN) [Online Database]
for this taxon

References:

Tertiary gene pool of Eggplant - *Solanum melongena*



Annual; caespitose. Culms erect; 60-200 cm long; 5-20 mm diam. Culm-internodes elliptical in section. Leaves mostly basal. Leaf-sheaths keeled; outer margin hairy. Ligule a ciliolate membrane. Leaf-blades conduplicate; 30-60 cm long; 6-12 mm wide. Inflorescence composed of racemes. Peduncle glabrous, or pilose above (at raceme base). Racemes 4-7; digitate; erect; linear, or oblong; incurved; unilateral; 3-8 cm long; 9-15 mm wide. Rhachis wingless; flattened. Spikelet packing broadside to rhachis; crowded; regular; 2-rowed. Fertile Spikelets comprising 3-9 fertile florets; with diminished florets at the apex. Spikelets ovate; laterally compressed; 5-10 mm long; persistent on plant. Glumes similar; shorter than spikelet. Lower glume lanceolate; 2-5 mm long; 0.6-0.7 length of upper glume; membranous; 1-keeled; winged on keel; 1-3-veined. Lower glume apex acute. Upper glume elliptic; 3.5 mm long; 0.8-0.9 length of adjacent fertile lemma; membranous; 1-keeled; winged on keel; 5-7-veined. Upper glume apex acute. Florets: Fertile lemma lanceolate in profile; 4 mm long; membranous; 3-veined (excluding subsidiaries). Lemma midvein with contiguous subsidiary veins (3-veined). Lemma apex acute. Palea 0.9-1 length of lemma; 2-veined. Apical sterile florets resembling fertile though underdeveloped. Flower: Lodicules 2; cuneate; fleshy. Fruit: Caryopsis with free soft pericarp; orbicular; isodiametric; biconvex; exposed between gaping lemma and palea at maturity; 1.5-2.5 mm long; dark brown; rugose.

Habitat:



Disturbed ground often along roadsides.

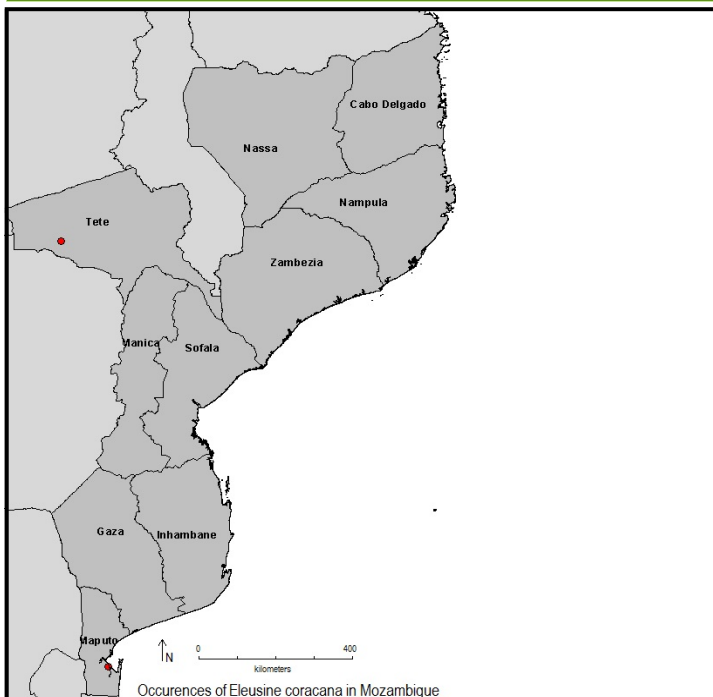
Distribution:

Widespread in Europe, Africa, Asia and Australasia.

Altitude: 730 - 1600 m

DISTINGUISHING FEATURES OF THIS SPECIES:

<p><i>Eleusine coracana</i></p> <p>Spikes 9-15 mm wide. Grain plump, usually brown.</p> 	<p>May be confused with: <i>Eleusine indica</i></p> <p>Spikes 3-7mm wide; grain elliptic to oblong, blackish.</p> 
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All populations priority
for collection

No accessions from
Mozambique listed on
Germplasm Resources
Information Network -
(GRIN) [Online Database]
for this taxon

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 03 May 2013; 14:32 GMT]; Flora Zambeziaca volume:10 part:2 (1999) Gramineae by T. Cope.; Phillips, S.M., A Survey of the Genus *Eleusine* Gaertn. (Gramineae) in Africa, Kew Bulletin, Vol. 27, No. 2..



Credit: Jose Hernandez @ USDA-NRCS PLANTS Database



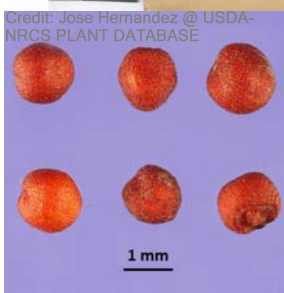
Credit: Maria Vorontsova/ RBG Kew



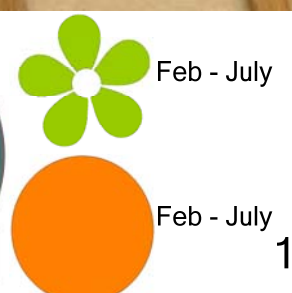
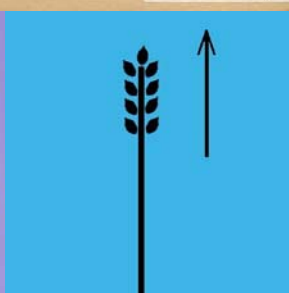
RBG Kew Herbarium specimen



RBG Kew Herbarium specimen



Credit: Jose Hernandez @ USDA-NRCS PLANT DATABASE



Taxon Group 4 relative of Abyssinian banana - *Ensete ventricosum*

Perennial monocarpic herb 1.5 -3 m high. Young stems dying back to a hard round corm. c. 30 cm in diameter at soil surface during the dry season. At flowering, leaf-blades spreading, spaced on pseudostem, the lowest up to 150 cm long, elliptic to narrowly elliptic, apex acute to acuminate, base cuneate. Midrib prominent below; lateral nerves numerous, forming an angle of 50 - 70 degrees with midrib. Inflorescence terminal on leafy shoot. Inflorescence bracts 4.5 - 9 x 17-25 cm, very broadly ovate, male ones mauve. Male flowers: calyx spathaceous, splitting down one side, remaining lobe ligulate, 3 lobed at apex; dorsal petal 3-lobed, with broad rounded lateral lobes and a central apiculus, stamens 6, 12 mm long. Female flower as male but ovary much larger and stamens rudimentary. Fruit c. 5 x 2 cm, narrowly ellipsoid, obtuse, splitting at maturity to reveal seeds embedded in an orange pulp. Seeds 7-9 mm diameter, black, hard.

Habitat:

Relatively dry habitats, dying down to a perennating corm in unfavourably dry seasons.

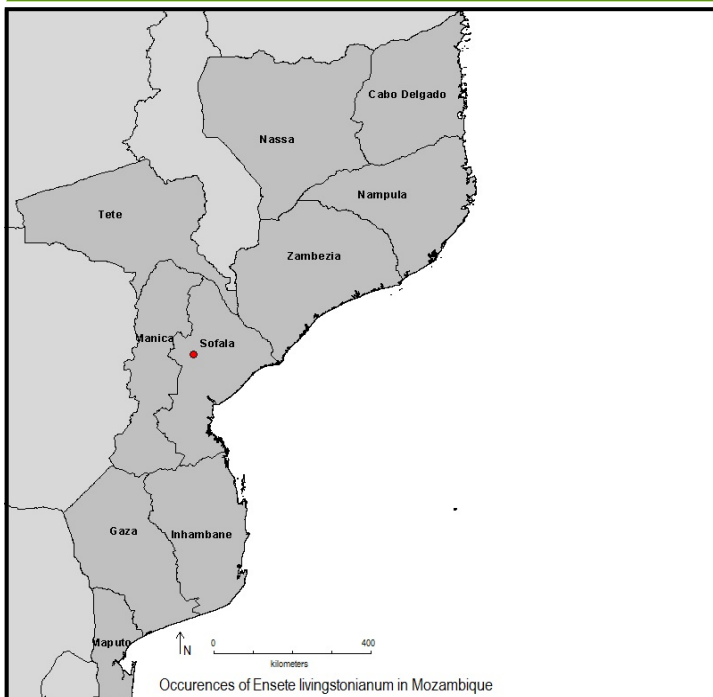
Distribution:

Found throughout central Africa.

Altitude: unknown

DISTINGUISHING FEATURES OF THIS SPECIES:

<i>Ensete livingstonianum</i>	May be confused with: <i>Ensete ventricosum</i>
3 m tall	6-12 m high when fully grown.



All populations priority
for collection

No accessions from
Mozambique listed on
Germplasm Resources
Information Network -
(GRIN) [Online Database]
for this taxon

References: Contu, S. 2013. *Ensete livingstonianum*. In: IUCN 2013. IUCN Red List of Threatened Species. Version 2013.1. <www.iucnredlist.org>. Downloaded on 17 September 2013.

MUSACEAE

Ensete livingstonianum (J.Kirk) Cheesman

Taxon Group 4 relative of Abyssinian banana - *Ensete ventricosum*



RBGKew Living Collections



RBGKew herbarium specimen



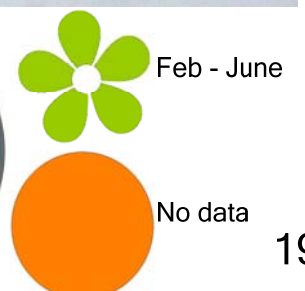
RBGKew herbarium specimen



RBGKew herbarium specimen



RBGKew Living Collections



Primary relative of Rice - *Oryza glaberrima* and *Oryza sativa*

Perennial. Rhizomes elongated. Culms geniculately ascending, or decumbent; 70-120 cm long; 5-10 mm diam. Leaf-sheaths smooth; glabrous on surface. Ligule an eciliate membrane; Leaf-blades 10-75 cm long; 5-25 mm wide. 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 in axils, or pubescent in axils.

Spikelets solitary. Fertile spikelets pedicelled.

Fertile spikelets comprising 2 basal sterile florets; 1 fertile florets; without rhachilla extension. Spikelets oblong; laterally compressed; 7-12 mm long; 2-3 mm wide; falling entire. Spikelet callus glabrous; base truncate; attached obliquely. Glumes both absent or obscure.

Basal sterile florets similar; barren; without significant palea.

Flower Lodicules 2; lanceolate; membranous. Anthers 6; 4.5-5.5 mm long. Stigmas 2.

Habitat:

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

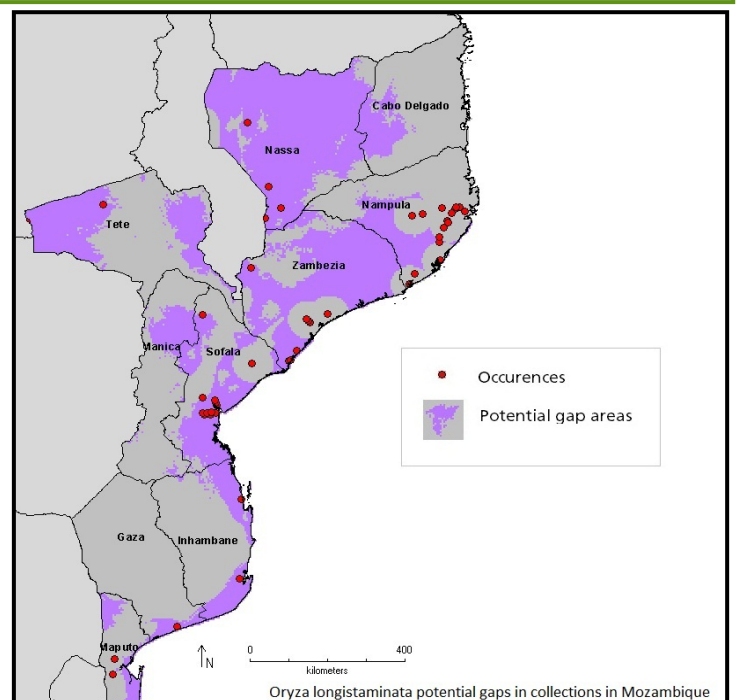
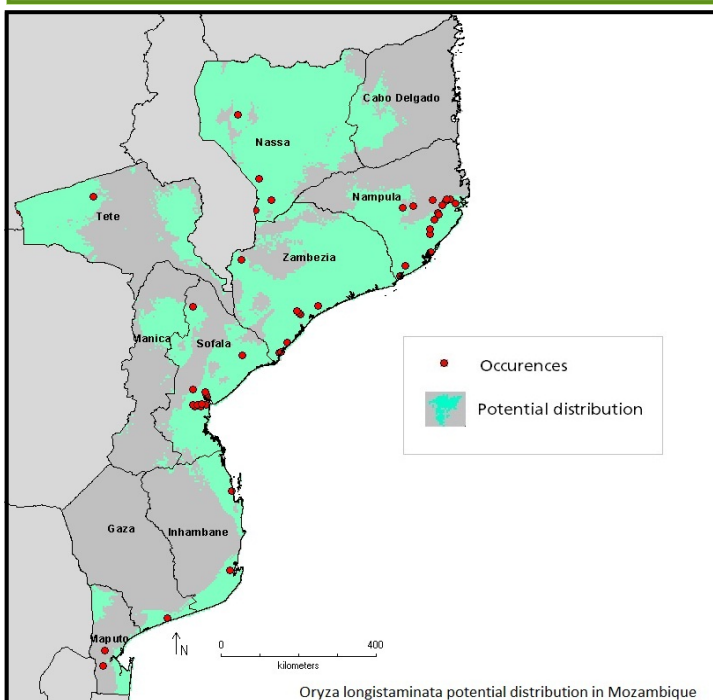
Distribution:

Throughout Africa.

Altitude: 0-2000 m

DISTINGUISHING FEATURES OF THIS SPECIES:

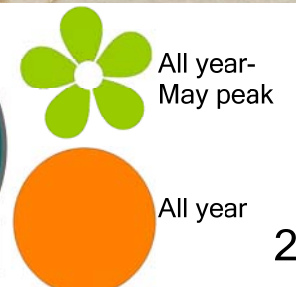
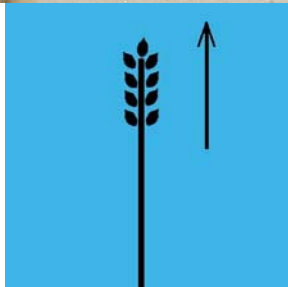
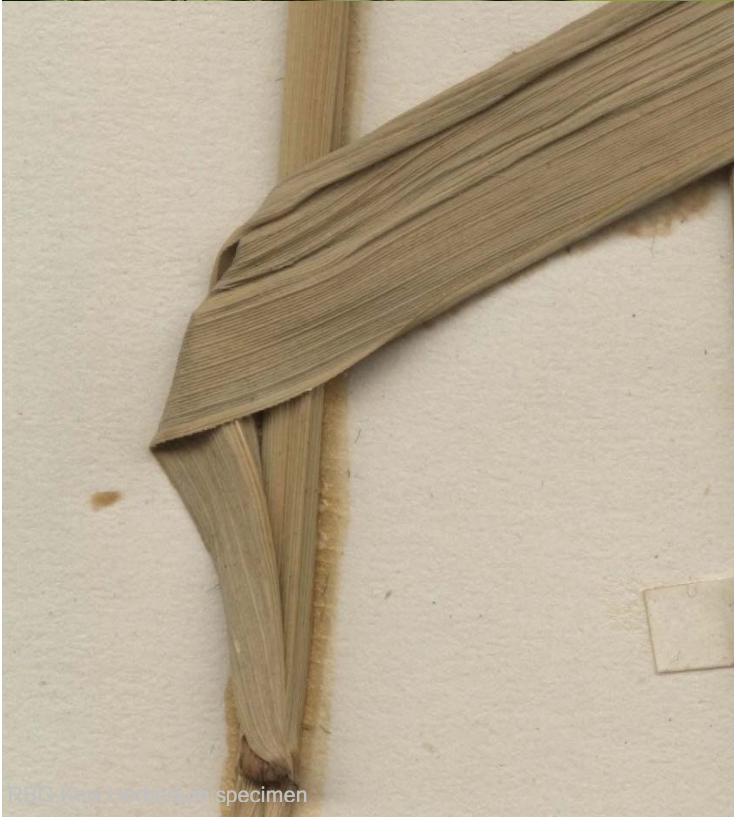
<i>Oryza longistaminata</i>	May be confused with: <i>Oryza sativa</i>
Red caryopsis.	Caryopsis brown to white.



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

Oryza longistaminata A.Chev. & Roehrich

Primary relative of Rice - *Oryza glaberrima* and *Oryza sativa*



Gene Pool Tertiary relative of *Sorghum bicolor*

Annual, or perennial; short-lived. Culms erect; 25-250 cm long. Culm-nodes bearded. Ligule a ciliolate membrane. Leaf-blades 10-30 cm long; 3-10 mm wide. Inflorescence a panicle with branches tipped by a raceme. Panicle open; oblong; 5-25 cm long. Racemes bearing 3-7 fertile spikelets on each. Rhachis fragile at the nodes; ciliate on margins. Rhachis hairs red; 2 mm long. Spikelets in pairs. Fertile spikelets sessile; 1 in the cluster. Companion sterile spikelets pedicelled; 1 in the cluster. Pedicels filiform; ciliate. Companion sterile spikelets well-developed; male; linear to lanceolate; 3-5 mm long. Fertile spikelets comprising 1 basal sterile florets; 1 fertile florets; without rhachilla extension. Spikelets elliptic, or oblong; dorsally compressed; 5-7 mm long. Spikelet callus hairs white, or red. Glumes dissimilar; with lower wider than upper; exceeding apex of florets. Lower glume ovate; dark brown, or black; without keels; Lower glume surface glabrous, or pilose. Basal sterile florets barren; without significant palea. Lemma of lower sterile floret elliptic; 0.8 length of spikelet; hyaline; 2 -veined; ciliolate on margins. Fertile lemma oblong; 3-5 mm long; hyaline; 1 -veined. Lemma margins ciliate. Flower Lodicules 2; ciliate.

Habitat:

Tropical dry forest.

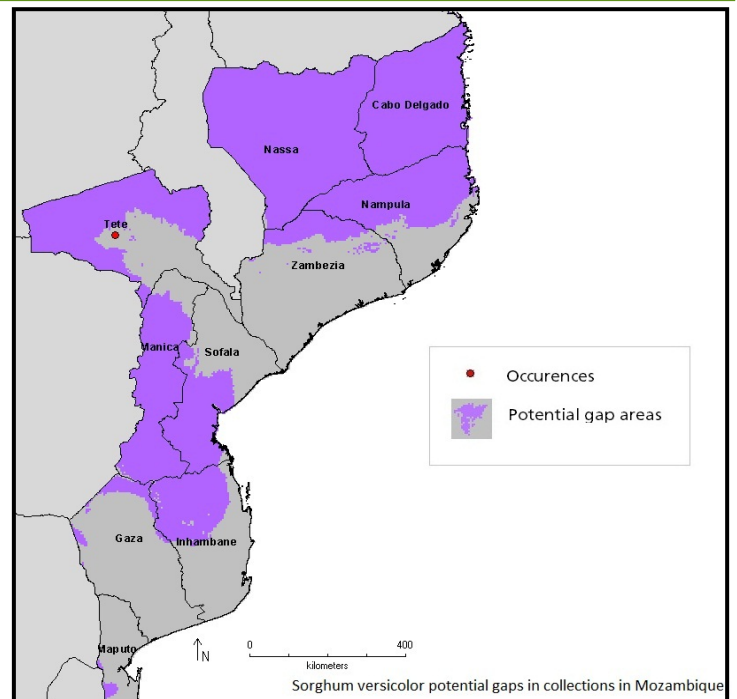
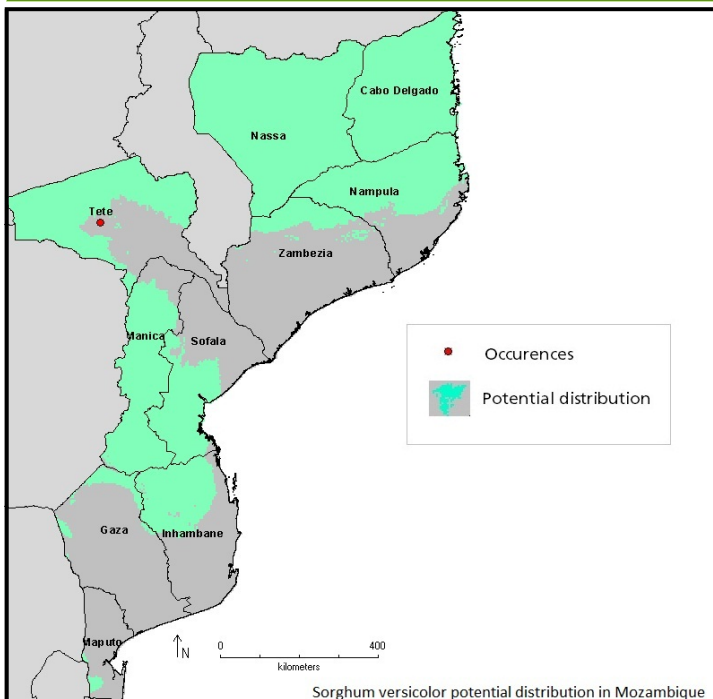
Distribution:

Africa: northeast tropical, east tropical, southern tropical, and south.

Altitude: unknown

DISTINGUISHING FEATURES OF THIS SPECIES:

<i>Sorghum versicolor</i>	May be confused with:
	Information not available.



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 22nd April 2013; 15:14 GMT]

Gene Pool Tertiary relative of *Sorghum bicolor*



RBGKew herbarium specimen



RBGKew herbarium specimen

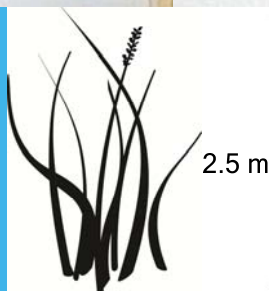


RBG Kew herbarium specimen



RBGKew herbarium specimen

No seed image available



Feb - May

Feb - May

HABIT: Annual or perennial, creeping. Stem glabrous to villous, hairs up to 0.8 mm.

LEAVES: Leaflets 3, 1.5-9 × 1.5-2.5 cm, obtuse and mucronulate at the apex, rounded-obtuse at the base, pubescent; petiole 1.5-8 cm; rhachis 0.2-1.5 cm; stipules 2.5-3 × 0.8 mm, bilobed at the base with lobes unequal, 3-nerved. Peduncle 2-8 cm × 0.2-0.8 mm, slightly pubescent; rhachis 0-2 cm long, 1-12-noded, internodes 2-3 mm.

FLOWER yellow, 7-8 × 7-10 mm; pedicel 1-3 mm, expanding as pod matures; bracteoles c. 1 mm, 1-nerved. Calyx slightly pubescent; tube c. 1 mm; lobes deltate, 0.8-1 mm, lower as long as the laterals, upper united in a rounded and emarginate lip. Standard with two U-shaped appendages; keel slightly twisted towards the left, without beak. Ovary 3-4-ovuled.

FRUIT: Pod 2-3 cm × c. 4 mm, linear-cylindrical, slightly curved, with short curved beak. Seed c. 5 × 3 mm; hilum 2 mm, almost central; rim aril reduced, not excentric.

Habitat:



Usually in disturbed areas and roadsides

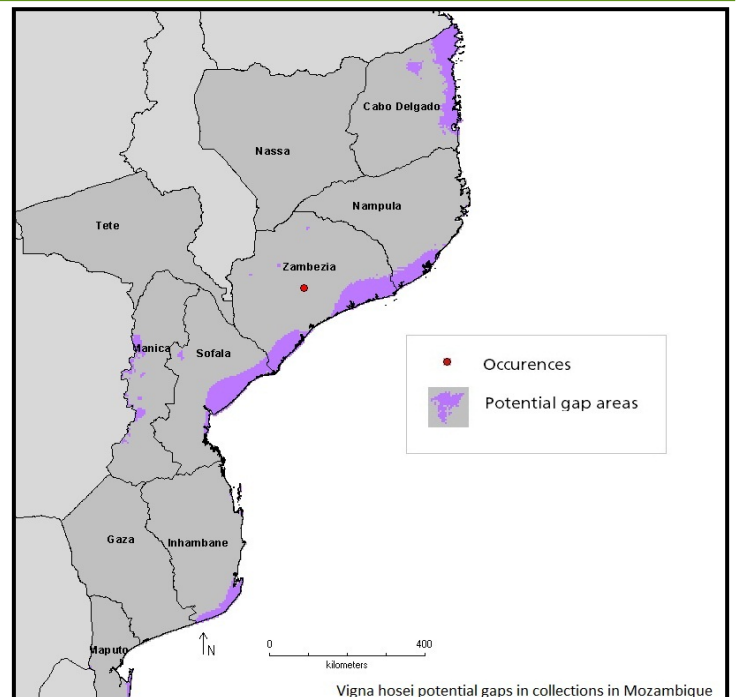
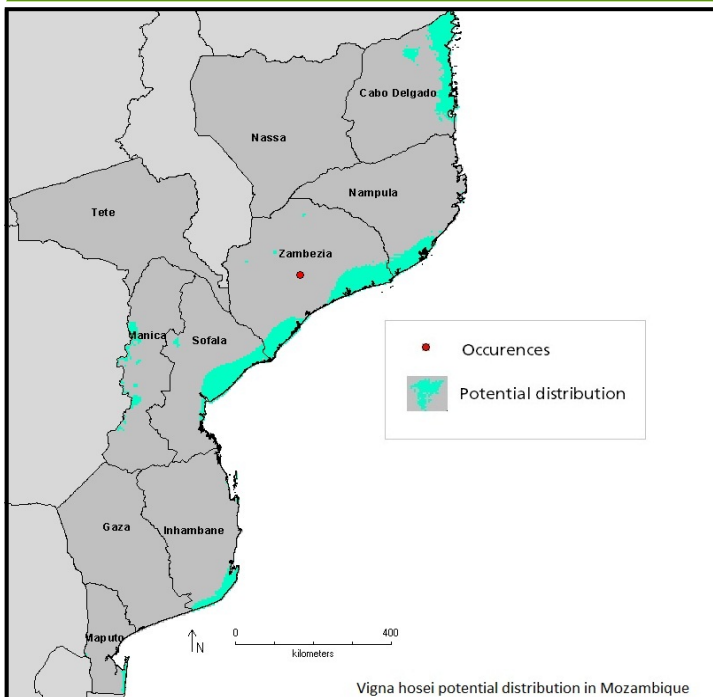
Distribution:

Naturalized in coastal plains from Kenya to Mozambique, around Lake Victoria, and maybe elsewhere in Africa

Altitude: 21 - 1200 m

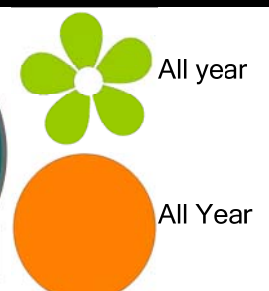
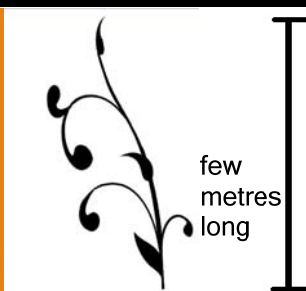
DISTINGUISHING FEATURES OF THIS SPECIES:

<p><i>Vigna hosei</i></p> <p>Yellow flowers.</p> 	<p>May be confused with: <i>Vigna parkeri</i></p> <p>Blue to violet flowers, never forms subterranean pods.</p> 
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References: FZ volume:3 part:5 (2001) Leguminosae by B. Mackinder, R. Pasquet, R. Polhill and B. Verdcourt; <http://proseanet.org>.

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Genepool 1B of Cowpea - *Vigna unguiculata*

Perennial climbing herb, usually from a carrot-shaped rootstock. Stem glabrous or scabrous when young. Leaflets rhombic or lanceolate, acute. Peduncle 0.8-2 mm wide; rachis 0.5-2.5 cm long, 3-4-noded, internodes 2-4 mm long. Flower 20-32 mm long. Calyx glabrous; lobes 6-15 mm long; keel without a beak, twisted towards the left (while looking at the keel from the standard). Ovary 15-18-ovuled. Pod scabrous.

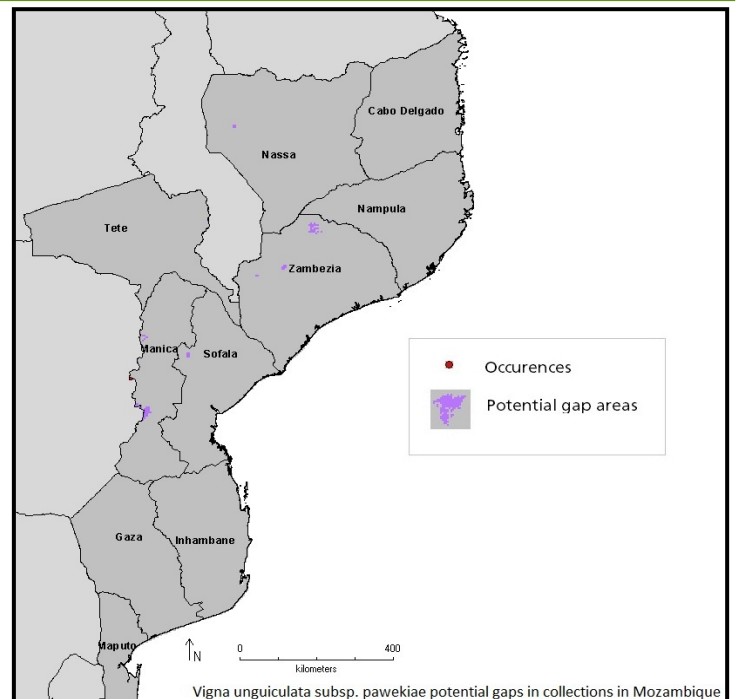
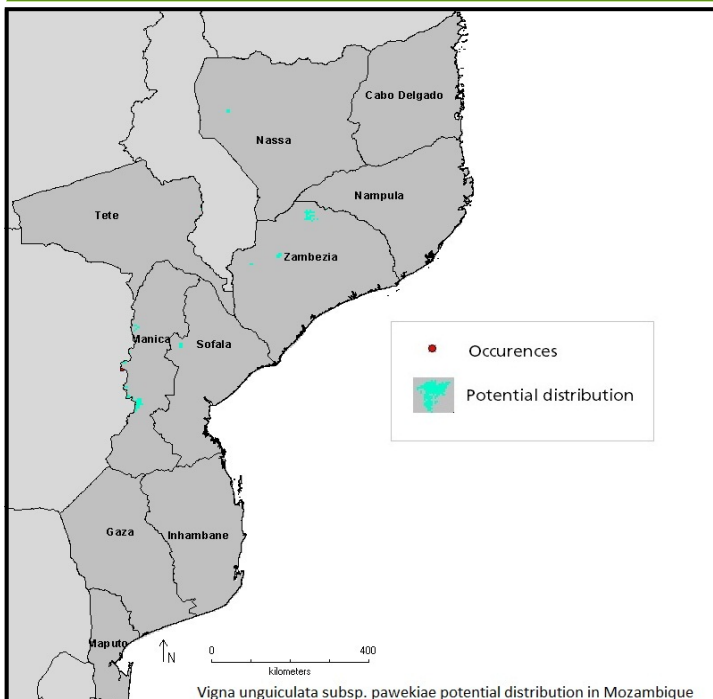
Habitat:
Forest edge, swampy area.

Distribution:
Tropical East Africa

Altitude: 1100-2300 m

DISTINGUISHING FEATURES OF THIS SPECIES:

<i>Vigna unguiculata subsp. pawekiae</i>	May be confused with: <i>Other Vigna unguiculata subspecies</i>
Stipules 6-10 mm; rachis 5 mm, 3-4 noded; ovary 15 - 18 ovules.	



References: Flora Zambeziaca volume:3 part:5 (2001) Leguminosae by B. Mackinder, R. Pasquet, R. Polhill and B. Verdcourt



RBG Kew herbarium specimen

RBG Kew herbarium specimen



Mar - Sep

Mar - Dec

Vigna unguiculata subsp. *pubescens* (R. Wilczek) PasquetGenepool 1B of Cowpea - *Vigna unguiculata*

Annual or perennial. Stem stout, densely pubescent with short appressed white hairs. Rhachis of inflorescence 2-6.5 cm long, 5-12-noded, internodes 6-15 mm long, pubescent. Flower 17-24 mm long. Calyx pubescent; lobes 1.5-5 mm long, deltate. Keel slightly incurved towards the right (while looking at the keel from the standard), the beak short. Ovary 13-17 ovuled. Pod covered with a short dense and appressed pubescence of tubercle-based hairs.

Habitat:

Grassland and savanna, usually near water.

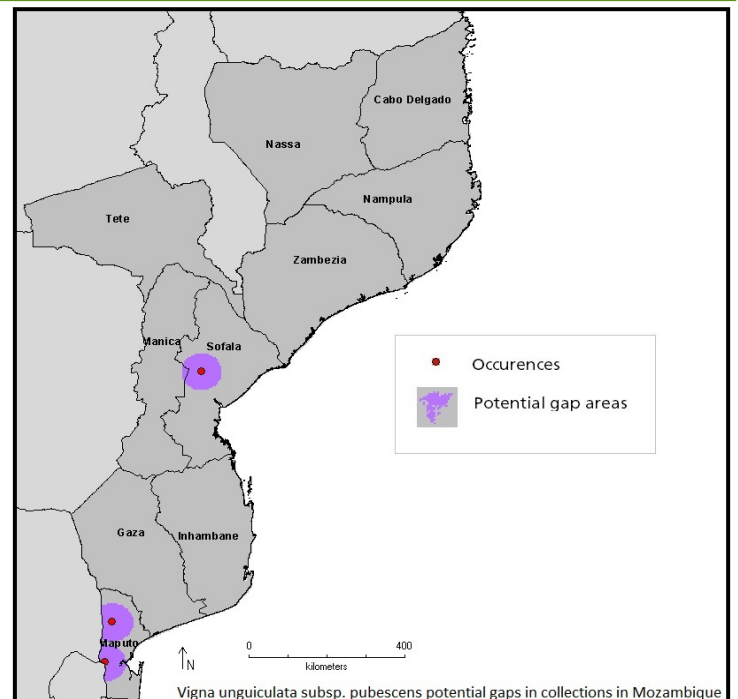
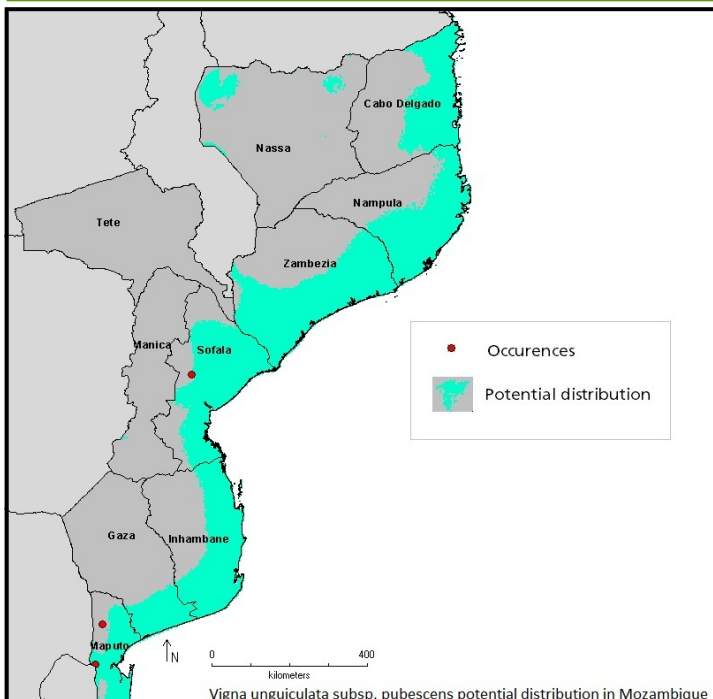
Distribution:

Tropical Africa from DRC to Kenya, and south as far as Mozambique.

Altitude: 0 - 1200 m

DISTINGUISHING FEATURES OF THIS SPECIES:

<i>Vigna unguiculata</i> subsp. <i>pubescens</i>	May be confused with: <i>Other Vigna unguiculata</i> subspecies
Dense pubescence on stems, calyx and pods.	



References: Flora Zambeziaca volume:3 part:5 (2001) Leguminosae by B. Mackinder, R. Pasquet, R. Polhill and B. Verdcourt

Vigna unguiculata subsp. *pubescens* (R. Wilczek) Pasquet

Genepool 1B of Cowpea - *Vigna unguiculata*



No seed image available



Aug - Feb

Aug - Apr

Vigna unguiculata subsp. tenuis (E.Mey.) Marechal, Mascherpa & Stainier

Genepool 1B of Cowpea - *Vigna unguiculata*

Perennial with a rootstock. Stem glabrous. Terminal leaflet glabrous, rhombic, obtuse at the apex. Peduncle 0.8-2 mm wide; rachis up to 0.4 cm long, 1-2-noded, internodes 2-3 mm long, scabrous. Flower 14-22 mm long. Calyx glabrous; lobes 1-4 mm long. Keel with a short beak, twisted towards the right (while looking at the keel from the standard). Ovary 12-17-ovuled. Pod scabrous.

N.B. Mozambique specimens, especially coastal specimens, are quite different and look like intermediates with subsp. *unguiculata*. The inflorescence rachis is often up to 3-noded. Flowers are bigger and ovule numbers are markedly higher. Pods are (13)14-17-ovuled in Mozambique instead of 12-15(16)-ovuled in other Flora Zambeziaca countries.

Habitat:

Grassland, miombo woodland, sandy places close to the coast.

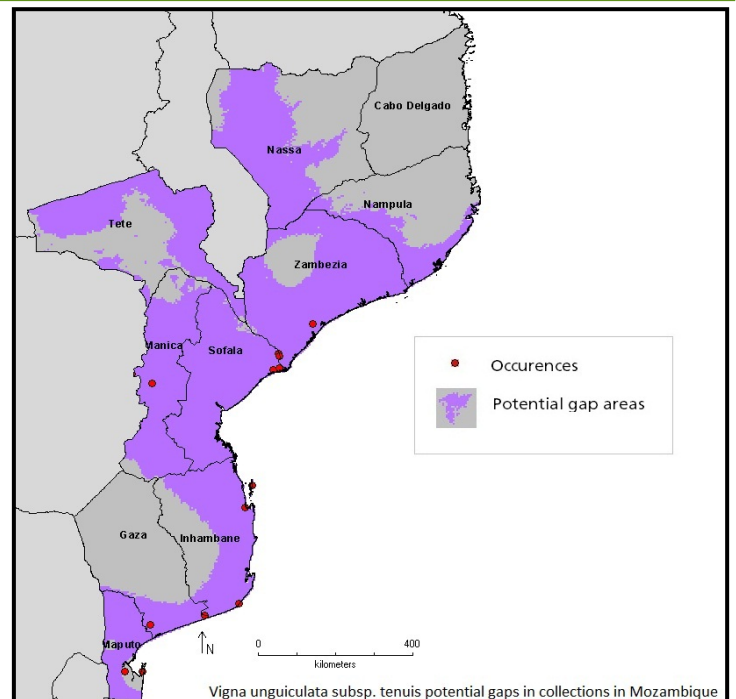
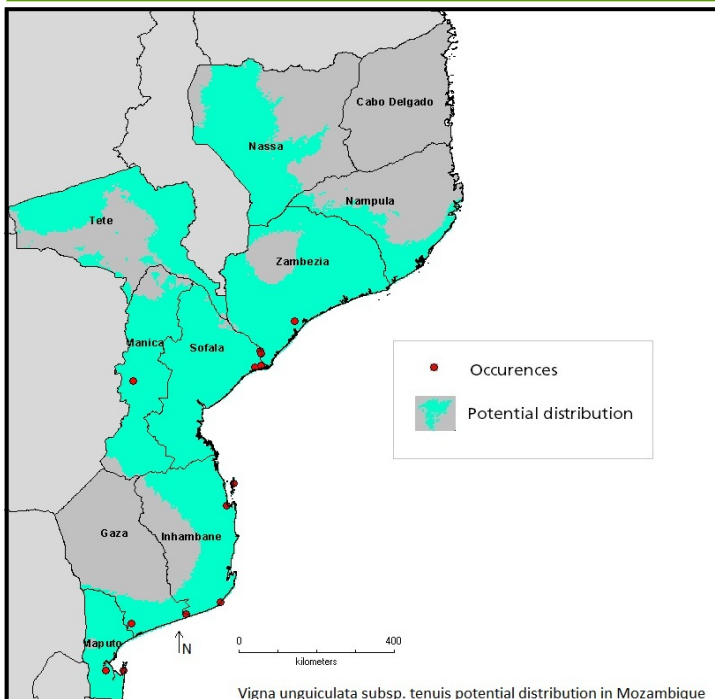
Distribution:

South Africa, and Eastern Africa: Mozambique, Malawi, Zambia and Zimbabwe.

Altitude: 0 - 1600 m

DISTINGUISHING FEATURES OF THIS SPECIES:

<i>Vigna unguiculata subsp. tenuis</i>	May be confused with: <i>Other Vigna unguiculata subspecies</i>
Inflorescence rachis 1-2 noded; plant with a rootstock; leaflets rhombic.	



References: Flora Zambeziaca volume:3 part:5 (2001) Leguminosae by B. Mackinder, R. Pasquet, R. Polhill and B. Verdcourt

Vigna unguiculata subsp. *tenuis* (E.Mey.) Marechal, Mascherpa & Stainier

Genepool 1B of Cowpea - *Vigna unguiculata*



RBG Kew herbarium specimen

No seed image available



LC PRELIM



Aug - Apr

Aug - Apr

Vigna unguiculata var. *spontanea* (Schweinf.) Pasquet

Genepool 1B of Cowpea - *Vigna unguiculata*

Wild, or sometimes as a weed, usually annual, (perennial in the Indian Ocean coastal forest belt). Stem glabrous, scabrous when young, rarely with scattered pubescence. Peduncle 0.5-3 mm wide; rachis 0.7-3 cm long, 4-8-noded, internodes 1-6 mm long, scabrous. Flower not scented, 15-23 mm long. Calyx glabrous; lobes 1.5-4 mm long. Keel with a short beak, slightly twisted towards the right (while looking at the keel from the standard). Ovary 16-18-ovuled. Pod scabrous, less than 10 cm long and 5 mm wide.

Habitat:

Savanna, especially in disturbed areas, often as a weed.

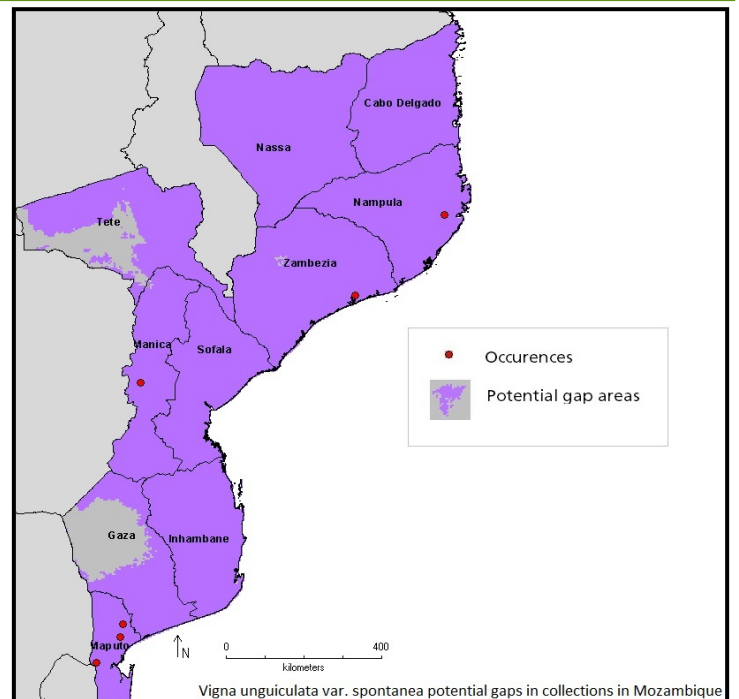
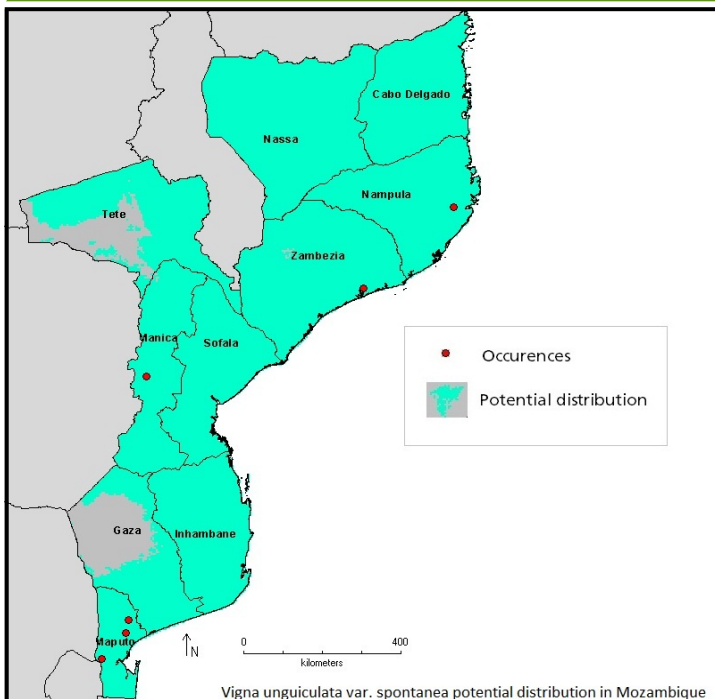
Distribution:

Southern Africa: Botswana; and Eastern Africa: Mozambique, Malawi, Zambia and Zimbabwe.

Altitude: 0 - 1400 m

DISTINGUISHING FEATURES OF THIS SPECIES:

<i>Vigna unguiculata</i> var. <i>spontanea</i>	May be confused with: <i>Other Vigna unguiculata</i> subspecies
Petiole 50 - 60 mm; flower 25-31 mm.	



References: Flora Zambeziaca volume:3 part:5 (2001) Leguminosae by B. Mackinder, R. Pasquet, R. Polhill and B. Verdcourt

Vigna unguiculata var. *spontanea* (Schweinf.) Pasquet

Genepool 1B of Cowpea - *Vigna unguiculata*

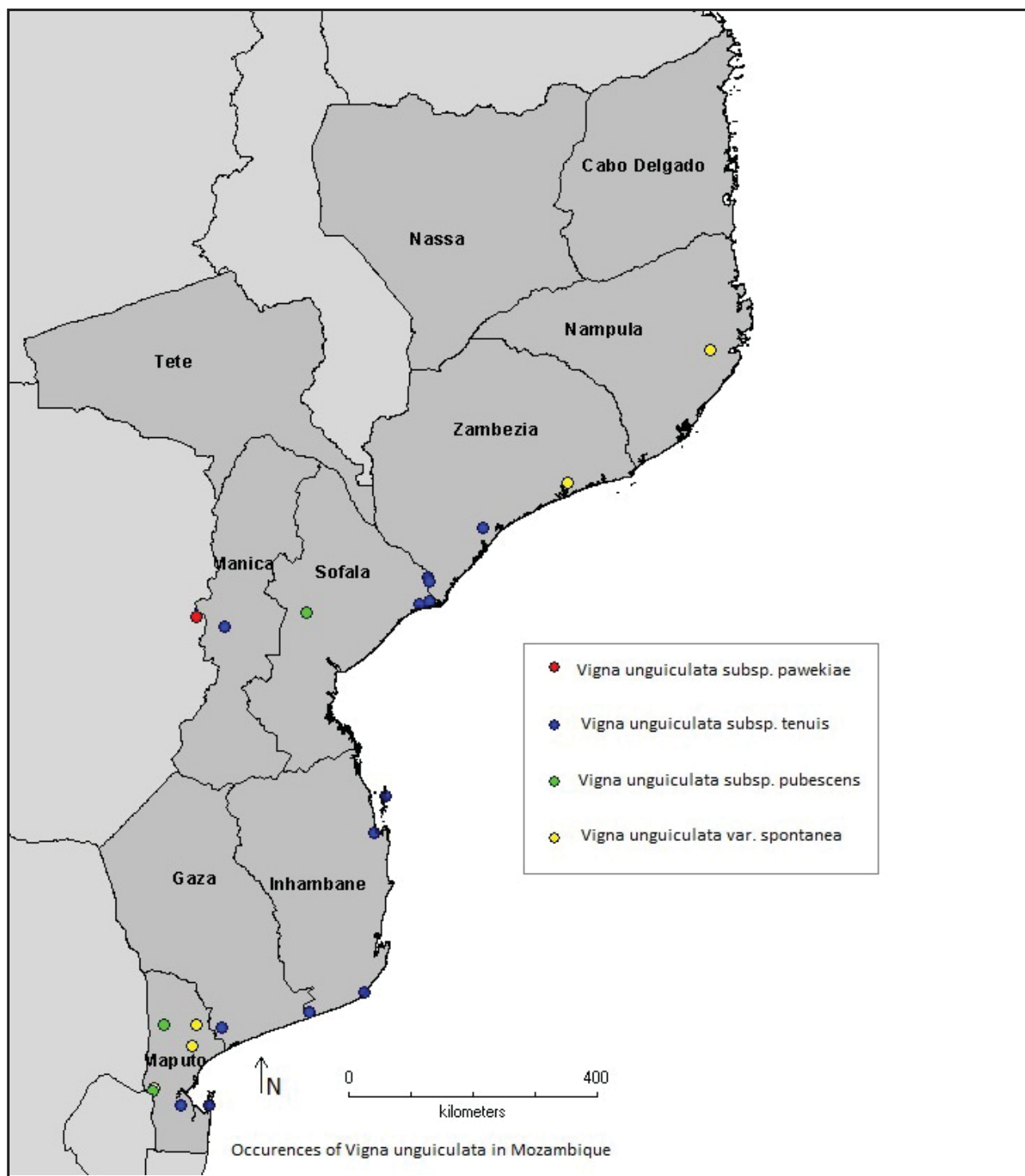


No seed image available



















Sep - Apr

Nov - May



Map showing distributions of *Vigna unguiculata* subspecies and varieties in Mozambique.

Taxon	Identifying features	Fruit	Leaves	Phenology
subsp. <i>pawekiae</i>	Stipules 6-10 mm; rachis 5 mm, 3-4 noded; ovary 15 - 18 ovules.			  March - September - March - December -
subsp. <i>pubescens</i>	Dense pubescence on stems, calyx and pods.			  August - February - August - April
subsp. <i>tenuis</i>	Inflorescence rachis 1-2 noded; plant with a rootstock; leaflets rhombic.			  August - April August - April
var. <i>spontanea</i>	Petiole 50 - 60 mm; flower 25-31 mm.			  September - April - November - May -

Wild relative of sweet potato

Morning glory, Mile-a-minute vine

HABIT: Perennial herb with twining and trailing stems. Roots tuberous and plant rooting at nodes. Plants hairless.
LEAVES: round in outline, 3-10 cm long and wide, deeply 5-segmented with basal segments often lobed; leaf stalk 2-6 cm long. Inflorescence axillary, 1-3 flowered.

FLOWERS: funnel-shaped violet (rarely white) joined petals 3.5-6 cm long, 6-8 cm wide, with darker violet hairless mid-petal bands, throat usually darker. Surrounded by sepals 0.4-0.8 cm long, stamens and style included in flower tube.

FRUIT: Capsule almost globe-shaped, 9-12 mm wide, with 2 chambers, splitting into 4 valves, contains up to 4 seeds.

Seeds dark brown to black, 5-6 mm long, flattened ovoid, hairy with pale brown long hairs on outer ridges.

Habitat:

A common inhabitant of swampy grassland, riverine edges and roadsides, where it may cover extensive areas.

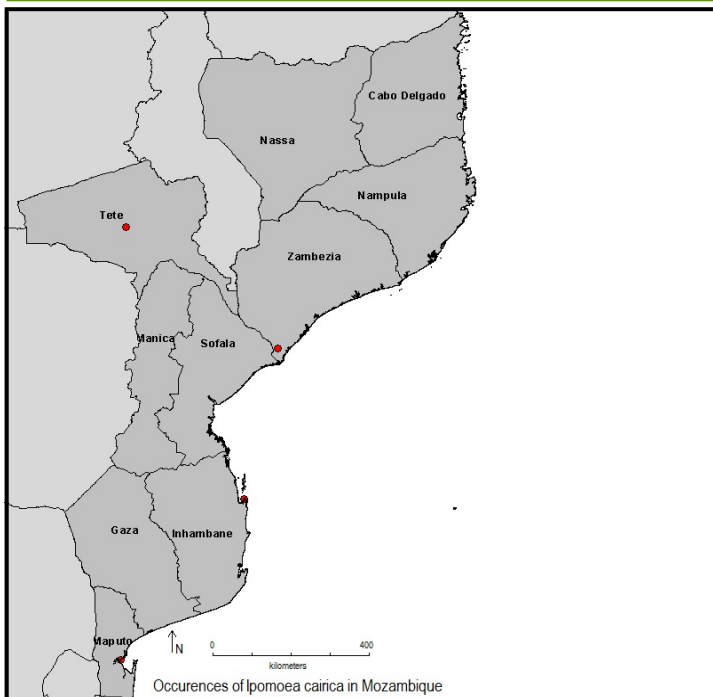
Distribution:

Throughout tropical Africa; also from the eastern Mediterranean region through Asia to Taiwan.

Altitude: Up to 1650 m

DISTINGUISHING FEATURES OF THIS SPECIES:

<i>Ipomoea cairica</i>	May be confused with: <i>Ipomoea batatas</i>
Deeply 5 segmented leaves.	Leaves not segmented.



All populations priority
for collection

No accessions from
Mozambique listed on
Germplasm Resources
Information Network -
(GRIN) [Online Database]
for this taxon

References: Hyde, M.A., Wursten, B.T., Ballings, P. & Dondeyne, S. (2013). Flora of Mozambique: Species information: *Ipomoea cairica* var. *cairica*. http://www.mozambiqueflora.com/speciesdata/species.php?species_id=147580, retrieved 22 May 2013; Thorp, J.R., Wilson, M, Weeds Australia - www.weeds.org.au



Credit: BT Wursten/ Flora of Mozambique website



Credit: BT Wursten/ Flora of Mozambique website

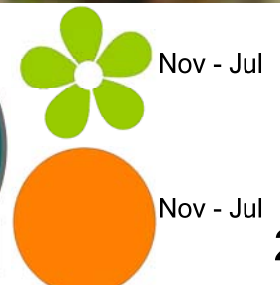


Credit: BT Wursten/ Flora of Mozambique website



Credit: Sheldon Navie

Credit: Steve Hurst @ USDA-NRCS PLANTS Database



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

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

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; 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, gobose 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

DISTINGUISHING FEATURES OF THIS SPECIES:

<p><i>Ipomoea ochracea</i></p> <p>Corolla bright yellow.</p> 	<p>May be confused with: <i>Ipomoea obscura</i></p> <p>Corolla white or pale yellow.</p> 
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All populations priority
for collection

No accessions from
Mozambique listed on
Germplasm Resources
Information Network -
(GRIN) [Online Database]
for this taxon

References: Wagner, Warren L./Herbst, Derral R./Sohmer, S. H. 1999. Manual of the flowering plants of Hawaii. Revised edition. Material for seed image provided by IBPGR.

CONVOLVULACEAE

Wild relative of sweet potato

Ipomoea ochracea (Lindl.) G. Don

Yellow morning glory



Credit: Forest & Kim Starr



Credit: Forest & Kim Starr



Credit: Forest & Kim Starr



Credit: Forest & Kim Starr

Gemma Toothill (c) Board of Trustees RBG Kew



3 m



All year

All year

Appendix - Synonyms

a

Taxon	Sheet	Synonyms
<i>Solanum anguivi</i> Lam.	1	<i>Solanum indicum</i> L.; <i>Solanum indicum</i> var. <i>lividum</i> (Link) Bitter; <i>Solanum indicum</i> var. <i>maroanum</i> Bitter; <i>Solanum lividum</i> Link; <i>Solanum sodomeum</i> L. <i>Solanum scalare</i> C. H. Wright
<i>Solanum campylacanthum</i> Hochst.	2	<i>Solanum suaveolens</i> Bojer; <i>Solanum bojeri</i> var. <i>sinuatorepandum</i> Dunal
<i>Solanum catombelense</i> Peyr.	3	<i>Solanum albotomentosum</i> C.H.Wright; <i>Solanum rautanenii</i> Schinz; <i>Solanum sparsiflorum</i> Dammer. in DC.; <i>Solanum bojeri</i> Dunal
<i>Solanum dasyphyllum</i> Schumach.	4	<i>Solanum duplosinuatum</i> Klotzsch
<i>Solanum linnaeanum</i> Hepper & P.M.L.Jaeger	5	<i>Solanum sodomeum</i> auct.; <i>Solanum hermannii</i> auct.; <i>Solanum sodomeum</i> L. var. <i>hermannii</i> Dunal
<i>Solanum richardii</i> Dunal	6	<i>Solanum richardii</i> var. <i>pallidum</i> Dunal; <i>Solanum acanthocalyx</i> Klotzsch; <i>Solanum bathocladon</i> Dammer; <i>Solanum magnusianum</i> Dammer; <i>Solanum acutilobatum</i> Dammer; <i>Solanum burtt-davyi</i> Dunkley; <i>Solanum richardii</i> var. <i>acutilobatum</i> (Dammer) A.E.Gonç.; <i>Solanum richardii</i> var. <i>burtt-davyi</i> (Dunkley) A.E.Gonç.
<i>Solanum aureitomentosum</i> Bitter	7	<i>Solanum chrysotrichum</i> C.H.Wright
<i>Solanum litoraneum</i> A.E.Gonç.	8	
<i>Solanum torreanum</i> A.E.Gonç.	9	
<i>Solanum usaramense</i> Dammer	10	<i>Solanum filicaule</i> Dammer
<i>Solanum zanzibarense</i> Vatke	11	
<i>Eleusine africana</i> Kenn.-O'Byrne	12	<i>Eleusine coracana</i> subsp. <i>africana</i> (Kenn.-O'Byrne) Hilu & de Wet; <i>Eleusine indica</i> subsp. <i>africana</i> (Kenn.-O'Byrne) S.M.Phillips
<i>Eleusine indica</i> (L.) Gaertn.	13	<i>Agropyron geminatum</i> Schult. & Schult.f.; <i>Chloris repens</i> Steud.; <i>Cynodon indicus</i> (L.) Raspail; <i>Cynosurus ara</i> Buch.-Ham. ex Wall.; <i>Cynosurus indicus</i> L.; <i>Cynosurus pectinatus</i> Lam.; <i>Eleusine distachya</i> Trin. ex Steud.; <i>Eleusine distans</i> Link; <i>Eleusine distans</i> Moench; <i>Eleusine domingensis</i> Sieber ex Schult.; <i>Eleusine glabra</i> Schumach.; <i>Eleusine gonantha</i> Schrank; <i>Eleusine gouinii</i> E.Fourn.; <i>Eleusine inaequalis</i> E.Fourn.; <i>Eleusine indica</i> var. <i>major</i> E.Fourn.; <i>Eleusine indica</i> var. <i>monostachya</i> F.M.Bailey; <i>Eleusine indica</i> var. <i>oligostachya</i> Honda; <i>Eleusine indica</i> var. <i>sandaensis</i> Vanderyst; <i>Eleusine japonica</i> Steud.; <i>Eleusine macrosperma</i> Stokes; <i>Eleusine marginata</i> Lindl.; <i>Eleusine polydactyla</i> Steud.; <i>Eleusine rigidifolia</i> E.Fourn.; <i>Eleusine scabra</i> E.Fourn.; <i>Eleusine textilis</i> Welw.; <i>Juncus loureiroana</i> Schult. & Schult.f.; <i>Leptochloa pectinata</i> (Lam.) Kunth; <i>Paspalum dissectum</i> Kniph.; <i>Poa spicata</i> Willd. ex Steud.; <i>Triticum geminatum</i> Spreng.

Appendix - Synonyms

b

<i>Pennisetum purpureum</i> Schumach.	14	<i>Pennisetum benthamii</i> Steud.; <i>Pennisetum purpureum</i> subsp. <i>benthamii</i> (Steud.) Maire & Weiller; <i>Pennisetum purpureum</i> subsp. <i>flexispica</i> (K.Schum.) Maire & Weiller
<i>Sorghum bicolor</i> ssp. <i>verticilliflorum</i> (L.) Moench	15	<i>Sorghum verticilliflorum</i> (Steud.) Stapf; <i>Sorghum brevicarinatum</i> Snowden; <i>Andropogon sorghum</i> var. <i>aethiopicus</i> Hack.; <i>Andropogon sorghum</i> (L.) Brot. subsp. <i>vogelianus</i> Piper; <i>Sorghum vogelianum</i> (Piper) Stapf; <i>Sorghum usambarense</i> Snowden; <i>Sorghum macrochaeta</i> Snowden; <i>Sorghum bicolor</i> (L.) Moench subsp. <i>arundinaceum</i> (Desv.) de Wet & J. R. Harlan ex Davidse; <i>Rhaphis arundinacea</i> Desv.; <i>Sorghum virgatum</i> (Hack.) Stapf; <i>Sorghum stapfii</i> (Hook. f.) C. E. C. Fisch.; <i>Holcus sorghum</i> L. var. <i>effusus</i> Hitchc.; <i>Andropogon arundinaceus</i> Willd.; <i>Andropogon sorghum</i> (L.) Brot. var. <i>virgatus</i> Hack.; <i>Andropogon sorghum</i> (L.) Brot. var. <i>effusus</i> Hack.; <i>Andropogon verticilliflorus</i> Steud.; <i>Sorghum pugionifolium</i> Snowden; <i>Holcus sorghum</i> L. var. <i>verticilliflorus</i> (Steud.) Hitchc.; <i>Sorghum arundinaceum</i> (Desv.) Stapf; <i>Sorghum lanceolatum</i> Stapf; <i>Sorghum aethiopicum</i> (Hack.) Rupr. ex Stapf; <i>Andropogon stapfii</i> Hook. f.
<i>Oryza schweinfurthiana</i> Prodoehl	16	
<i>Solanum lichtensteinii</i> Willd.	17	<i>Solanum esculentum</i> Drège ex Dunal; <i>Solanum homblei</i> De Wild.; <i>Solanum incanum</i> var. <i>lichtensteinii</i> (Willd.) Bitter; <i>Solanum incanum</i> var. <i>subexarmatum</i> (Dunal) Bitter; <i>Solanum leycesterianum</i> Savi ex Delile; <i>Solanum subexarmatum</i> Dunal.
<i>Eleusine coracana</i> Gaertn.	18	<i>Eleusine stricta</i> Roxb.; <i>Eleusine stricta</i> var. <i>alboabbreviata</i> Cif.; <i>Eleusine stricta</i> var. <i>alboelongata</i> Cif.; <i>Eleusine stricta</i> var. <i>fuscoabbreviata</i> Cif.; <i>Eleusine stricta</i> var. <i>fuscoelongata</i> Cif.; <i>Eleusine stricta</i> var. <i>rufoabbreviata</i> Cif.; <i>Eleusine stricta</i> var. <i>rufoelongata</i> Cif.; <i>Eleusine tocussa</i> Fresen.; <i>Eleusine tocussa</i> var. <i>erytroleuca</i> Chiov.; <i>Eleusine tocussa</i> var. <i>erytromelana</i> Chiov.; <i>Eleusine tocussa</i> var. <i>flavocarpa</i> Chiov.; <i>Eleusine tocussa</i> var. <i>leucocarpa</i> Chiov.; <i>Eleusine tocussa</i> var. <i>melanocarpa</i> Chiov.; <i>Eleusine tocussa</i> var. <i>olivacea</i> Chiov.
<i>Ensete livingstonianum</i> (J.Kirk) Cheesman	19	<i>Ensete elephantorum</i> (K.Schum. & Warb.) Cheesman; <i>Ensete gillettii</i> (De Wild.) Cheesman; <i>Ensete religiosum</i> Cheesman [Invalid]; <i>Musa chevalieri</i> Gagnep.; <i>Musa elephantorum</i> K.Schum. & Warb.; <i>Musa gillettii</i> De Wild.; <i>Musa livingstoniana</i> J.Kirk; <i>Musa religiosa</i> Dyb.
<i>Oryza longistaminata</i> A.Chev. & Roehrich	20	<i>Oryza barthii</i> auct.
<i>Sorghum versicolor</i> Andersson	21	<i>Andropogon serratus</i> var. <i>versicolor</i> (Andersson) Hack. ; <i>Sarga versicolor</i> (Andersson) Spangler; <i>Sorghum purpureosericeum</i> var. <i>trinervatum</i> Chiov.
<i>Vigna hosei</i> Backer ex K.Heyne	22	<i>Dolichos hosei</i> Craib; <i>Vigna oligosperma</i> Backer nom. Nud.
<i>Vigna unguiculata</i> ssp. <i>pawekiae</i> Walp.	23	<i>Vigna unguiculata</i> subsp. <i>mensensis</i> ; <i>Vigna unguiculata</i> var. <i>mensensis</i> .
<i>Vigna unguiculata</i> ssp. <i>pubescens</i> Walp.	24	<i>Vigna pubescens</i> R. Wilczek; <i>Vigna unguiculata</i> subsp. <i>protracta</i> ; <i>Vigna unguiculata</i> var. <i>protracta</i> ; <i>Vigna unguiculata</i> var. <i>pubescens</i> (R. Wilczek) Maréchal

Appendix - Synonyms

<i>Vigna unguiculata ssp. tenuis</i> Walp.	25	<i>Scytalis tenuis var. oblonga</i> E. Mey.; <i>Scytalis tenuis var. ovata</i> E. Mey.; <i>Vigna coerulea</i> Baker; <i>Vigna malosana</i> Baker; <i>Vigna tenuis</i> (E. Mey.) D. Dietr.; <i>Vigna unguiculata var. dekindtiana</i> Maréchal
<i>Vigna unguiculata var. spontanea</i> Walp.	26	<i>Dolichos hastifolius</i> Schnizl.; <i>Dolichos obliquifolius</i> Schnizl.; <i>Liebrechtsia scabra</i> De Wild.; <i>Phaseolus mungo</i> sensu De Wild.; <i>Vigna angustifolia</i> sensu De Wild.; <i>Vigna brachycalyx</i> Baker; <i>Vigna dekindtiana</i> sensu Baker f.; <i>Vigna dekindtiana</i> sensu Brenan; <i>Vigna scabra</i> (De Wild.) T. & H. Durand; <i>Vigna scabrida</i> Burt Davy; <i>Vigna sinensis var. catjang</i> sensu Chiov.; <i>Vigna sinensis var. spontanea</i> Schweinf.; <i>Vigna unguiculata subsp. dekindtiana</i> sensu Verdcourt; <i>Vigna unguiculata var. dekindtiana</i> sensu Maréchal
<i>Ipomoea cairica</i> (L.) Sweet	27	<i>Batatas cavanillesii</i> (Roem. & Schult.) G. Don; <i>Batatas senegalensis</i> G. Don; <i>Convolvulus cairicus</i> L.; <i>Convolvulus cavanillesii</i> (Roem. & Schult.) Spreng.; <i>Convolvulus limphaticus</i> Vell.; <i>Ipomoea cavanillesii</i> Roem. & Schult.; <i>Ipomoea funaria</i> Larrañaga; <i>Ipomoea heptaphylla</i> Griseb.; <i>Ipomoea pentaphylla</i> Cav.; <i>Ipomoea rosea var. pluripartita</i> Hassl.; <i>Ipomoea senegalensi</i> Lam.; <i>Ipomoea vesiculosa</i> P. Beauv.
<i>Ipomoea ochracea</i> (Lindl.) G. Don	28	<i>Ipomoea curtisii</i> House; <i>Ipomoea ochracea var. curtisii</i> (House) Stearn