

Family: *Cucurbitaceae*

Taxon: *Luffa acutangula*

Synonym: *Cucumis acutangulus* L. (*basionym*)

Common Name: angled loofah
Chinese okra
dishcloth gourd
ribbed gourd
strainervine

Questionnaire : current 20090513
Status: Assessor Approved

Assessor: Assessor
Data Entry Person: Assessor

Designation: EVALUATE

WRA Score 2

101	Is the species highly domesticated?	y=-3, n=0	y
102	Has the species become naturalized where grown?	y=1, n=-1	y
103	Does the species have weedy races?	y=1, n=-1	y
201	Species suited to tropical or subtropical climate(s) - If island is primarily wet habitat, then substitute "wet tropical" for "tropical or subtropical"	(0-low; 1-intermediate; 2-high) (See Appendix 2)	High
202	Quality of climate match data	(0-low; 1-intermediate; 2-high) (See Appendix 2)	High
203	Broad climate suitability (environmental versatility)	y=1, n=0	n
204	Native or naturalized in regions with tropical or subtropical climates	y=1, n=0	y
205	Does the species have a history of repeated introductions outside its natural range?	y=-2, ?=-1, n=0	y
301	Naturalized beyond native range	y = 1*multiplier (see Appendix 2), n= question 205	y
302	Garden/amenity/disturbance weed	n=0, y = 1*multiplier (see Appendix 2)	
303	Agricultural/forestry/horticultural weed	n=0, y = 2*multiplier (see Appendix 2)	n
304	Environmental weed	n=0, y = 2*multiplier (see Appendix 2)	n
305	Congeneric weed	n=0, y = 1*multiplier (see Appendix 2)	y
401	Produces spines, thorns or burrs	y=1, n=0	n
402	Allelopathic	y=1, n=0	
403	Parasitic	y=1, n=0	n
404	Unpalatable to grazing animals	y=1, n=-1	n
405	Toxic to animals	y=1, n=0	
406	Host for recognized pests and pathogens	y=1, n=0	n
407	Causes allergies or is otherwise toxic to humans	y=1, n=0	
408	Creates a fire hazard in natural ecosystems	y=1, n=0	n
409	Is a shade tolerant plant at some stage of its life cycle	y=1, n=0	n

410	Tolerates a wide range of soil conditions (or limestone conditions if not a volcanic island)	y=1, n=0	n
411	Climbing or smothering growth habit	y=1, n=0	y
412	Forms dense thickets	y=1, n=0	n
501	Aquatic	y=5, n=0	n
502	Grass	y=1, n=0	n
503	Nitrogen fixing woody plant	y=1, n=0	n
504	Geophyte (herbaceous with underground storage organs -- bulbs, corms, or tubers)	y=1, n=0	n
601	Evidence of substantial reproductive failure in native habitat	y=1, n=0	n
602	Produces viable seed	y=1, n=-1	y
603	Hybridizes naturally	y=1, n=-1	
604	Self-compatible or apomictic	y=1, n=-1	n
605	Requires specialist pollinators	y=-1, n=0	n
606	Reproduction by vegetative fragmentation	y=1, n=-1	n
607	Minimum generative time (years)	1 year = 1, 2 or 3 years = 0, 4+ years = -1	1
701	Propagules likely to be dispersed unintentionally (plants growing in heavily trafficked areas)	y=1, n=-1	y
702	Propagules dispersed intentionally by people	y=1, n=-1	y
703	Propagules likely to disperse as a produce contaminant	y=1, n=-1	n
704	Propagules adapted to wind dispersal	y=1, n=-1	
705	Propagules water dispersed	y=1, n=-1	y
706	Propagules bird dispersed	y=1, n=-1	n
707	Propagules dispersed by other animals (externally)	y=1, n=-1	n
708	Propagules survive passage through the gut	y=1, n=-1	
801	Prolific seed production (>1000/m2)	y=1, n=-1	n
802	Evidence that a persistent propagule bank is formed (>1 yr)	y=1, n=-1	
803	Well controlled by herbicides	y=-1, n=1	y
804	Tolerates, or benefits from, mutilation, cultivation, or fire	y=1, n=-1	
805	Effective natural enemies present locally (e.g. introduced biocontrol agents)	y=-1, n=1	

Designation: EVALUATE

WRA Score 2

Supporting Data:

101	2004. Grubben, G.J.H. (ed.). Plant Resources of Tropical Africa. Volume 2. Vegetables. PROTA, Wageningen, Netherlands	[Is the species highly domesticated? Yes] "Luffa acutangula is believed to have originated in India, where wild types still occur, but has now spread pantropically to all areas with a high rainfall." ... "In Luffa acutangula 3 varieties have been distinguished: var. acutangula, the large fruited cultivated types; var. amara (Roxb.) C.B.Clarke, a wild or feral type with extremely bitter fruits and confined to India; and var. forskalii (Harms) Heiser & E.E.Schill., confined to Yemen, where it occurs wild or possibly as an escape. Luffa acutangula cultivars grown as vegetables have larger fruits and are less bitter than the wild types. In West Africa local cultivars are used as vegetables, whereas in East Africa commercial growers use improved cultivars imported from Asian countries for the Asian customers."
102	2004. Grubben, G.J.H. (ed.). Plant Resources of Tropical Africa. Volume 2. Vegetables. PROTA, Wageningen, Netherlands	[Has the species become naturalized where grown? Yes] "Luffa acutangula is believed to have originated in India, where wild types still occur, but has now spread pantropically to all areas with a high rainfall. It is cultivated and locally naturalized in West Africa, from Sierra Leone to Nigeria." ... "...it is also locally cultivated and naturalized in Madagascar, Réunion and Mauritius."
103	2004. Grubben, G.J.H. (ed.). Plant Resources of Tropical Africa. Volume 2. Vegetables. PROTA, Wageningen, Netherlands	[Does the species have weedy races? Yes] "In Luffa acutangula 3 varieties have been distinguished: var. acutangula, the large fruited cultivated types; var. amara (Roxb.) C.B.Clarke, a wild or feral type with extremely bitter fruits and confined to India; and var. forskalii (Harms) Heiser & E.E.Schill., confined to Yemen, where it occurs wild or possibly as an escape. Luffa acutangula cultivars grown as vegetables have larger fruits and are less bitter than the wild types."
201	2012. Lim, T.K.. Edible Medicinal and Non-Medicinal Plants. Volume 2, Fruits. Springer, New York	[Species suited to tropical or subtropical climate(s) 2-High] "Luffa is indigenous to the old world tropic, probably India, now naturalized throughout South and south-east Asia and cultivated elsewhere in the tropics and subtropics."
202	2012. Lim, T.K.. Edible Medicinal and Non-Medicinal Plants. Volume 2, Fruits. Springer, New York	[Quality of climate match data 2-High]
203	2004. Grubben, G.J.H. (ed.). Plant Resources of Tropical Africa. Volume 2. Vegetables. PROTA, Wageningen, Netherlands	[Broad climate suitability (environmental versatility)? No] "Unlike many other cucurbits it grows well in tropical lowlands. It prefers seasonal climates because dry-season planting is more successful than wet-season planting. In Africa it thrives in the dry forest or moist savanna area, around 8–10°N. Outside these latitudes, too much rain or excessive dryness often affect the development of the fruits. In humid areas growth is directed towards the production of leaf biomass, whereas under dry conditions the energy is directed towards abundant flowering. Too much heavy rainfall during flowering and fruiting leads to fruit rot. Frost is not tolerated."
203	2008. Janick, J./Paull, R.E.. The Encyclopedia of Fruit & Nuts. Cabi Publishing, Wallingford, UK	[Broad climate suitability (environmental versatility)? No] "Luffa is a heat-loving vine that does not tolerate cool temperatures and thus requires special cultural procedures in order to be grown successfully in temperate regions..."
204	2004. Grubben, G.J.H. (ed.). Plant Resources of Tropical Africa. Volume 2. Vegetables. PROTA, Wageningen, Netherlands	[Native or naturalized in regions with tropical or subtropical climates? Yes] "It is cultivated and locally naturalized in West Africa, from Sierra Leone to Nigeria." ... "...it is also locally cultivated and naturalized in Madagascar, Réunion and Mauritius."
205	2004. Grubben, G.J.H. (ed.). Plant Resources of Tropical Africa. Volume 2. Vegetables. PROTA, Wageningen, Netherlands	[Does the species have a history of repeated introductions outside its natural range? Yes] "Luffa acutangula is believed to have originated in India, where wild types still occur, but has now spread pantropically to all areas with a high rainfall. It is cultivated and locally naturalized in West Africa, from Sierra Leone to Nigeria. It is cultivated from the coastal areas to the semi-dry savanna, e.g. in Sierra Leone, Côte d'Ivoire, Ghana, Benin and Nigeria. In East Africa ridged gourd is grown on a small scale near the big cities as an exotic vegetable for consumers of Asian origin, and it is also locally cultivated and naturalized in Madagascar, Réunion and Mauritius. In southern and eastern Asia it is a widely cultivated vegetable."
205	2005. Staples, G.W./Herbst, D.R.. A Tropical Garden Flora - Plants Cultivated in the Hawaiian Islands and Other Tropical Places. Bishop Museum Press, Honolulu, HI	[Does the species have a history of repeated introductions outside its natural range? Yes] "It is commonly cultivated in vegetable gardens in Hawaii for its fruit, which is harvested green and cooked as a vegetable."
301	2004. Grubben, G.J.H. (ed.). Plant Resources of Tropical Africa. Volume 2. Vegetables. PROTA, Wageningen, Netherlands	[Naturalized beyond native range? Yes] "It is cultivated and locally naturalized in West Africa, from Sierra Leone to Nigeria." ... "...it is also locally cultivated and naturalized in Madagascar, Réunion and Mauritius."
302	2000. Meyer, J-Y.. Preliminary review of the invasive plants in the Pacific islands (SPREP Member Countries). Invasive species in the Pacific: A technical review and draft regional strategy. South Pacific Regional Environment Programme, Samoa	[Garden/amenity/disturbance weed? Potentially a weed] "Nauru Preliminary list of invasive plants" [Luffa acutangula listed among Potential invaders]

302	2004. Grubben, G.J.H. (ed.). Plant Resources of Tropical Africa. Volume 2. Vegetables. PROTA, Wageningen, Netherlands	[Garden/amenity/disturbance weed? Potentially] "Ridged gourd may be common as a spontaneous plant on abandoned land, as a fallow crop and on garbage heaps."
303	2012. Randall, R.P.. A Global Compendium of Weeds. 2nd Edition. Department of Agriculture and Food, Western Australia	[Agricultural/forestry/horticultural weed? No] No evidence
304	2012. Randall, R.P.. A Global Compendium of Weeds. 2nd Edition. Department of Agriculture and Food, Western Australia	[Environmental weed? No] No evidence
305	2011. BioNET-EAFRINE. Keys and Fact Sheets - <i>Luffa cylindrica</i> (Vegetable Sponge Gourd). http://keys.lucidcentral.org/keys/v3/eafrinet/weeds/key/weeds/Media/Html/Luffa_cylindrica_%28Vegetable_Sponge_Gourd%29.htm [Accessed 17 May 2013]	[Congeneric weed? Yes] " <i>Luffa cylindrica</i> is naturalised in parts of Kenya and Tanzania and invasive in parts of Uganda (A.B.R. Witt pers. obs.)." ... "This species is capable of invading disturbed areas."
305	2011. Reddy, G.P.. Survey of invasive plants on Guam and identification of the 20 most widespread. <i>Micronesica</i> . 41(2): 263–274.	[Congeneric weed? Impacts unspecified] "Table 2. List of invasive plant species recorded on Guam, in descending order of estimated coverage of the island." [<i>Luffa cylindrica</i> - Total acreage covered on Guam (estimated) = 37.96]
401	2004. Grubben, G.J.H. (ed.). Plant Resources of Tropical Africa. Volume 2. Vegetables. PROTA, Wageningen, Netherlands	[Produces spines, thorns or burrs? No] "Monoecious, annual, climbing or trailing herb, with acutely 5-angled stem; tendrils up to 6-fid, hairy. Leaves alternate, simple; stipules absent; petiole up to 15 cm long; blade broadly ovate to kidney-shaped in outline, 10–25 cm × 10–25 cm, shallowly palmately 5–7-lobed with broadly triangular to broadly rounded lobes, cordate at base, shallowly sinuate-dentate, pale green, scabrous, palmately veined. Male inflorescence racemose with 15–35 cm long peduncle."
402	2013. WRA Specialist. Personal Communication.	
403	2004. Grubben, G.J.H. (ed.). Plant Resources of Tropical Africa. Volume 2. Vegetables. PROTA, Wageningen, Netherlands	[Parasitic? No] "Monoecious, annual, climbing or trailing herb..." [Cucurbitaceae]
404	2009. Konwar, P./Saikia, M.K./Saikia, P.K.. Abundance of food plant species and food habits of <i>Rhinoceros unicornis</i> Linn. Pobitora Wildlife Sanctuary, Assam, India. <i>Journal of Threatened Taxa</i> , 1(9), 457-460.. 1(9): 457-460.	[Unpalatable to grazing animals? Unspecified part consumed by rhinos] "Table 2. List of cultivated food plant species consumed by rhinos in Pobitora Wildlife Sanctuary" [Includes <i>Luffa acutangula</i> and <i>Luffa cylindrica</i>]
404	2011. Small, E.. Top One Hundred Exotic Food Plants. CRC Press, Boca Raton, FL	[Unpalatable to grazing animals? No] "Young leaves, blossoms, and seeds are also edible and can be simmered until tender then added to vegetable dishes." [Description of palatability to humans would presumably also apply to browsing and grazing animals]
405	2011. Small, E.. Top One Hundred Exotic Food Plants. CRC Press, Boca Raton, FL	[Toxic to animals? Unknown] "Young leaves, blossoms, and seeds are also edible and can be simmered until tender then added to vegetable dishes." ... "The seeds of various other species of <i>Luffa</i> have been used as a drastic purgative (to induce vomiting). They are toxic and should not be eaten by humans, pets or livestock." [Seeds of unspecified <i>Luffa</i> species are reportedly toxic, but <i>L. acutangula</i> seeds are reportedly edible]
406	2003. Owens, G.. Asian Melons, Fact Sheet VF1. Northern Territory Government, Darwin NT	[Host for recognized pests and pathogens? No] "Pests and Diseases: Both luffas and winter melons are relatively insensitive to most pests and diseases. However powdery mildew and downy mildew can cause problems if left uncontrolled. The major insect pests are fruit flies and aphids."
406	2004. Grubben, G.J.H. (ed.). Plant Resources of Tropical Africa. Volume 2. Vegetables. PROTA, Wageningen, Netherlands	[Host for recognized pests and pathogens? No. Host of pests with broad host range already] "Ridged gourd is not very susceptible to diseases and pests. Powdery mildew (<i>Erysiphe cichoracearum</i>) and downy mildew (<i>Pseudoperonospora cubensis</i>) are reported. Fruits rot easily in contact with wet soil. In South-East Asia, the larvae of fruit flies (<i>Dacus</i> spp.) may damage young fruits; a high infection of thrips may cause stunted growth, and also caterpillars, leaf miners and aphids are reported as pests."
407	2004. Grubben, G.J.H. (ed.). Plant Resources of Tropical Africa. Volume 2. Vegetables. PROTA, Wageningen, Netherlands	[Causes allergies or is otherwise toxic to humans? Seeds may be toxic] "Immature fruits of less-bitter cultivars of <i>Luffa acutangula</i> are used as a vegetable. They are cooked or fried and used in soups and sauces. Occasionally, the stem tops with young leaves and flower buds are used as a leafy vegetable. In South-East Asia, ridged gourd is a popular vegetable because of the mildly bitter flavour, the slightly spongy texture and sweet juiciness. Young fruits of sweet cultivars are also eaten raw and small fruits are sometimes pickled. The seeds yield an edible oil that is, however, sometimes bitter and toxic."

407	2011. Small, E.. Top One Hundred Exotic Food Plants. CRC Press, Boca Raton, FL	[Causes allergies or is otherwise toxic to humans? Seeds may be toxic] "Young leaves, blossoms, and seeds are also edible and can be simmered until tender then added to vegetable dishes." ... "The seeds of various other species of <i>Luffa</i> have been used as a drastic purgative (to induce vomiting). They are toxic and should not be eaten by humans, pets or livestock." [Seeds of unspecified <i>Luffa</i> species are reportedly toxic, but <i>L. acutangula</i> seeds are reportedly edible]
408	2004. Grubben, G.J.H. (ed.). Plant Resources of Tropical Africa. Volume 2. Vegetables. PROTA, Wageningen, Netherlands	[Creates a fire hazard in natural ecosystems? No] " <i>Luffa acutangula</i> is believed to have originated in India, where wild types still occur, but has now spread pantropically to all areas with a high rainfall." [No evidence. Climbing vines could presumably act as fuel ladders in natural ecosystems, but no evidence of increased fire hazards or flammability was found in the existing literature, and unlikely due to occurrence in areas of high rainfall]
409	2012. Lim, T.K.. Edible Medicinal and Non-Medicinal Plants. Volume 2, Fruits. Springer, New York	[Is a shade tolerant plant at some stage of its life cycle? No] "It thrives in full sun and on a well-drained sandy loam soils, with a pH 6.5-7.5 and rich in organic matter."
410	1987. Roecklein, J.C./Leung, P. (eds.). A Profile of economic plants. Transaction Publishers, New Brunswick, NJ	[Tolerates a wide range of soil conditions?] " <i>Luffas</i> grow best in rich soils in the low humid tropics."
410	2003. Owens, G.. Asian Melons, Fact Sheet VF1. Northern Territory Government, Darwin NT	[Tolerates a wide range of soil conditions? No] "The best soils have good organic content with a neutral pH and are free draining."
410	2004. Grubben, G.J.H. (ed.). Plant Resources of Tropical Africa. Volume 2. Vegetables. PROTA, Wageningen, Netherlands	[Tolerates a wide range of soil conditions?] "Ridged gourd prefers a well-drained soil with a high organic matter content and a pH of 6.5–7.5."
411	2004. Grubben, G.J.H. (ed.). Plant Resources of Tropical Africa. Volume 2. Vegetables. PROTA, Wageningen, Netherlands	[Climbing or smothering growth habit? Yes] "Monoecious, annual, climbing or trailing herb..." [Cucurbitaceae]
411	2012. Lim, T.K.. Edible Medicinal and Non-Medicinal Plants. Volume 2, Fruits. Springer, New York	[Climbing or smothering growth habit? Yes] "A vigorous, climbing, coarse, monoecious, annual herb with branched, 3-fid tendrils and slender pentagonal, furrowed, densely hairy, green stem."
412	2012. Lim, T.K.. Edible Medicinal and Non-Medicinal Plants. Volume 2, Fruits. Springer, New York	[Forms dense thickets? No] "A vigorous, climbing, coarse, monoecious, annual herb with branched, 3-fid tendrils and slender pentagonal, furrowed, densely hairy, green stem."
501	2004. Grubben, G.J.H. (ed.). Plant Resources of Tropical Africa. Volume 2. Vegetables. PROTA, Wageningen, Netherlands	[Aquatic? No] " <i>Luffa acutangula</i> is believed to have originated in India, where wild types still occur, but has now spread pantropically to all areas with a high rainfall." [Terrestrial]
502	2004. Grubben, G.J.H. (ed.). Plant Resources of Tropical Africa. Volume 2. Vegetables. PROTA, Wageningen, Netherlands	[Grass? No] Cucurbitaceae
503	2004. Grubben, G.J.H. (ed.). Plant Resources of Tropical Africa. Volume 2. Vegetables. PROTA, Wageningen, Netherlands	[Nitrogen fixing woody plant? No] Cucurbitaceae
504	2004. Grubben, G.J.H. (ed.). Plant Resources of Tropical Africa. Volume 2. Vegetables. PROTA, Wageningen, Netherlands	[Geophyte (herbaceous with underground storage organs -- bulbs, corms, or tubers)? No] "Monoecious, annual, climbing or trailing herb, with acutely 5-angled stem; tendrils up to 6-fid, hairy. Leaves alternate, simple; stipules absent; petiole up to 15 cm long; blade broadly ovate to kidney-shaped in outline, 10–25 cm x 10–25 cm, shallowly palmately 5–7-lobed with broadly triangular to broadly rounded lobes, cordate at base, shallowly sinuate-dentate, pale green, scabrous, palmately veined. Male inflorescence racemose with 15–35 cm long peduncle."
601	2004. Grubben, G.J.H. (ed.). Plant Resources of Tropical Africa. Volume 2. Vegetables. PROTA, Wageningen, Netherlands	[Evidence of substantial reproductive failure in native habitat? No] No evidence
601	2012. Lim, T.K.. Edible Medicinal and Non-Medicinal Plants. Volume 2, Fruits. Springer, New York	[Evidence of substantial reproductive failure in native habitat? No] No evidence
602	2004. Grubben, G.J.H. (ed.). Plant Resources of Tropical Africa. Volume 2. Vegetables. PROTA, Wageningen, Netherlands	[Produces viable seed? Yes] "Propagation and planting - Ridged gourd is normally grown on supports or trellises up to 3 m high. During the dry season it may also be allowed to trail on the ground, but this practice lowers the yield and quality. The seeds are sown on mounds or ridges, 2–3 seeds per hill, 50–60 cm apart in the row and 200 cm between the rows in a trellised system."

603	2004. Grubben, G.J.H. (ed.). Plant Resources of Tropical Africa. Volume 2. Vegetables. PROTA, Wageningen, Netherlands	[Hybridizes naturally? Unknown] "Many local cultivars are found in the Asian countries and improved cultivars are available from several seed companies. Populations are very variable. F1 hybrid cultivars are used in several Asian countries. East-West Seed Company in Thailand developed F1 hybrids for tropical lowland with good market quality, e.g. pale or dark green fruits, short (35 cm) to long (50 cm) fruits. Malika F1 is a hybrid with high disease tolerance and especially suited for the rainy season." [Hybrid cultivars of different <i>L. acutangula</i> strains are produced artificially. Unknown if natural hybridization occurs]
604	1957. Fryxell, P.A.. Mode of Reproduction of Higher Plants. Botanical Review. 23(3): 135-233.	[Self-compatible or apomictic? No] "The principal caution in classifying a species in this category is that some species are incompletely dioecious or polygamous and occasionally or regularly produce monoecious or hermaphroditic individuals. In some species which show a direct and simple genetic control of such sexual polymorphism (e.g., <i>Luffa acutangula</i> and <i>Origanum vulgare</i>) and where this polymorphism is relatively stable, one can, of course, deduce that cross-pollination must be the rule on the basis of the genotypes involved." ... "VI. Tabulation of Modes of Reproduction" [<i>Luffa acutangula</i> = A. A - denotes principally cross-fertilized plants, including self-incompatible, dichogamous, and dioecious * species.]
605	2004. Grubben, G.J.H. (ed.). Plant Resources of Tropical Africa. Volume 2. Vegetables. PROTA, Wageningen, Netherlands	[Requires specialist pollinators? No] "Flowers unisexual, regular, 5-merous, 5–9 cm in diameter; receptacle tube obconic below, expanded above, c. 0.5 cm long, lobes triangular, 1–1.5 cm long; petals free, pale yellow; male flowers with 3 free stamens inserted on the receptacle tube, connectives broad; female flowers solitary, on pedicels 2–15 cm long, with inferior, densely pubescent, longitudinally ridged ovary, stigma 3-lobed." ... "The flowers open in the evening and the stigmas have been found to remain receptive from a few hours before to 36–60 hours after anthesis. The flowers are cross pollinated by many insects, including bees, butterflies and moths."
606	2013. Tropilab Inc.. <i>Luffa acutangula</i> - Ridged <i>Luffa</i> . http://www.tropilab.com/luf-acu.html [Accessed 16 May 2013]	[Reproduction by vegetative fragmentation? No] "Propagation - Seeds" [No evidence of spreading by vegetative means]
607	2004. Grubben, G.J.H. (ed.). Plant Resources of Tropical Africa. Volume 2. Vegetables. PROTA, Wageningen, Netherlands	[Minimum generative time (years)? <1] "Spontaneous growth of plants commences with the beginning of the rainy season. Flowering and fruiting take place throughout the rainy season, while fruits mature and seed dispersal commences as the whole plants become dry at the peak of the dry season. In cultivation, seedlings emerge 4–7 days after sowing after soaking the seeds in cold water overnight to soften the hard seedcoat. Ridged gourd tends to be day-neutral. Flowering starts 6–10 weeks after sowing. Initially male flowers are produced, later also female ones at a ratio of male to female flowers of about 40:1."
701	2004. Grubben, G.J.H. (ed.). Plant Resources of Tropical Africa. Volume 2. Vegetables. PROTA, Wageningen, Netherlands	[Propagules likely to be dispersed unintentionally? Yes] "Ridged gourd may be common as a spontaneous plant on abandoned land, as a fallow crop and on garbage heaps." [Probably dispersed in green waste]
702	1994. Stephens, J.M.. Gourd, <i>Luffa</i> — <i>Luffa cylindrica</i> (L.) Roem., <i>Luffa aegyptica</i> Mill., and <i>Luffa acutangula</i> (L.) Roxb. HS604. University of Florida, IFAS, Gainesville FL http://edis.ifas.ufl.edu .	[Propagules dispersed intentionally by people? Yes] "Both luffas have value as food items, but are seldom eaten in Florida. Most gardeners grow them for their fibrous interior, which is useful as a rough cloth or sponge for cleaning and scouring."
702	2004. Grubben, G.J.H. (ed.). Plant Resources of Tropical Africa. Volume 2. Vegetables. PROTA, Wageningen, Netherlands	[Propagules dispersed intentionally by people? Yes] "It is cultivated and locally naturalized in West Africa, from Sierra Leone to Nigeria. It is cultivated from the coastal areas to the semi-dry savanna, e.g. in Sierra Leone, Côte d'Ivoire, Ghana, Benin and Nigeria. In East Africa ridged gourd is grown on a small scale near the big cities as an exotic vegetable for consumers of Asian origin, and it is also locally cultivated and naturalized in Madagascar, Réunion and Mauritius. In southern and eastern Asia it is a widely cultivated vegetable."
703	2004. Grubben, G.J.H. (ed.). Plant Resources of Tropical Africa. Volume 2. Vegetables. PROTA, Wageningen, Netherlands	[Propagules likely to disperse as a produce contaminant? No] "Fruit a club-shaped, dry and fibrous capsule 15–50 cm x 5–10 cm, acutely 10-ribbed, brownish, dehiscent by an apical operculum, many-seeded. Seeds broadly elliptical in outline, compressed, up to 1.5 cm long, smooth, dull black." [No evidence, and unlikely as fruits and seeds are relatively large]
704	2004. Grubben, G.J.H. (ed.). Plant Resources of Tropical Africa. Volume 2. Vegetables. PROTA, Wageningen, Netherlands	[Propagules adapted to wind dispersal?] "Fruit a club-shaped, dry and fibrous capsule 15–50 cm x 5–10 cm, acutely 10-ribbed, brownish, dehiscent by an apical operculum, many-seeded. Seeds broadly elliptical in outline, compressed, up to 1.5 cm long, smooth, dull black." [Possibly wind or gravity dispersed over short distances]

705	2009. Schaefer, H./Heibl, C./Renner, S.S.. Gourds Afloat: A Dated Phylogeny Reveals an Asian Origin of the Gourd Family (Cucurbitaceae) and Numerous Oversea Dispersal Events. Proceedings of the Royal Society: Biological Sciences. 276(1658): 843-851.	[Propagules water dispersed? Yes] "Natural LDD of cucurbit diaspores may be frequent because many are adapted for transport by birds or wind, or they can withstand long periods in water (Cayaponia, Fevillea, Hodgsonia, Lagenaria, Luffa and Sicana; Ridley 1930; Whitaker & Carter 1954)." ... "Luffa originated in the Old World or Australia, and one species then reached the New World by LDD from Africa across the Atlantic as suggested by Heiser & Schilling (1988). The fruit is dry with fibrous tissue and probably well adapted to floating (Ridley 1930)."
706	2008. Janick, J./Paull, R.E.. The Encyclopedia of Fruit & Nuts. Cabi Publishing, Wallingford, UK	[Propagules bird dispersed? No] "Seeds are dispersed by the dehiscing of the styler end of the dry, senesced fruit. The seeds are ovoid and flat, approximately 14 mm long x 7 mm wide, usually black with a smooth or pitted surface and distinct margins. Two wing-like ridges occur on both sides of the opercular end..."
707	2004. Grubben, G.J.H. (ed.). Plant Resources of Tropical Africa. Volume 2. Vegetables. PROTA, Wageningen, Netherlands	[Propagules dispersed by other animals (externally)? No] "Fruit a club-shaped, dry and fibrous capsule 15–50 cm x 5–10 cm, acutely 10-ribbed, brownish, dehiscent by an apical operculum, many-seeded. Seeds broadly elliptical in outline, compressed, up to 1.5 cm long, smooth, dull black." [Fruits & seeds lack means of external attachment, and dry fruit are unlikely to be consumed or carried by animals]
708	2004. Grubben, G.J.H. (ed.). Plant Resources of Tropical Africa. Volume 2. Vegetables. PROTA, Wageningen, Netherlands	[Propagules survive passage through the gut? Unknown] "Fruit a club-shaped, dry and fibrous capsule 15–50 cm x 5–10 cm, acutely 10-ribbed, brownish, dehiscent by an apical operculum, many-seeded. Seeds broadly elliptical in outline, compressed, up to 1.5 cm long, smooth, dull black." [Unripe fruit are consumed by people, and possibly animals, but unknown whether seeds would survive intact]
801	2004. Grubben, G.J.H. (ed.). Plant Resources of Tropical Africa. Volume 2. Vegetables. PROTA, Wageningen, Netherlands	[Prolific seed production (>1000/m ²)? No] "Individual plants may produce 15–20 fruits; yield declines after 8–13 weeks of harvesting. For sponge production, the fruits are left for two months on the vines till turning brown. For seed production, the seeds are shaken out of the completely dry fruits."
802	2005. Hilli, J.S.. Studies on Seed Production and Post-Harvest Techniques in Ridge Gourd (<i>Luffa acutangula</i> L. Roxb). PhD Dissertation. Dharwad University, Dharwad, India	[Evidence that a persistent propagule bank is formed (>1 yr)? Possibly] "Dry seeds of bottle gourd stored in cooler environment extends their longevity, the seeds packed in laminated aluminium foil pouches and stored at 20 to 33°C temperature and 64 to 76 per cent relative humidity extended storage life for 10 months and seeds remain viable for five years when it was stored in 5 to 20°C (Villareal et al., 1972)."
802	2008. Larkcom, J.. Oriental Vegetables: The Complete Guide for the Gardening Cook. Kodansha America, Tokyo	[Evidence that a persistent propagule bank is formed (>1 yr)? Possibly] "Seeds extracted from the luffas can be saved for another season." [Unknown from field conditions]
803	2009. Englberger, K.. Invasive weeds of Pohnpei: A guide for identification and public awareness. Conservation Society of Pohnpei, Kolonia, FM	[Well controlled by herbicides? Probably Yes] "Triclopyr (Garlong 4) and glyphosate (Roundup) can be used" [Control information for <i>Luffa aegyptiaca</i> (syn. <i>L. cylindrica</i>) should be applicable to <i>L. acutangula</i>]
804	2004. Grubben, G.J.H. (ed.). Plant Resources of Tropical Africa. Volume 2. Vegetables. PROTA, Wageningen, Netherlands	[Tolerates, or benefits from, mutilation, cultivation, or fire? Possibly] "Lateral stems are pruned if they grow too abundantly. Some top and leaf pruning may promote flower and fruit development, resulting in a higher yield." [Unknown if plants would tolerate heavy pruning]
805	2013. WRA Specialist. Personal Communication.	[Effective natural enemies present locally (e.g. introduced biocontrol agents)? Unknown]

Summary of Risk Traits

High Risk / Undesirable Traits

- Naturalized in West Africa, from Sierra Leone to Nigeria, Madagascar, Réunion and Mauritius.
- Thrives in tropical climates
- Establishes in disturbed and abandoned sites
- Related species are invasive and weedy
- Seeds may be toxic to animals and people
- Climbing and possibly smothering habit
- Reaches maturity quickly (6-10 weeks)
- Fruits may be water dispersed

Low Risk / Desirable Traits

- Long history of cultivation. Despite ability to spread, no negative impacts have been documented
- Requires well-drained soil and full sun to thrive
- Edible fruit
- Fibrous interior used as a rough cloth or sponge
- Requires cross-pollination
- Relatively large fruits and seeds may limit dispersal potential
- Herbicides may provide effective control