

*Vitex rotundifolia* [简体中文](#) [正體中文](#)

**System:** Terrestrial

Kingdom	Phylum	Class	Order	Family
Plantae	Magnoliophyta	Magnoliopsida	Lamiales	Verbenaceae

**Common name** dan ye man jing (Chinese, China), roundleaf chastetree (English), single-leaf chaste tree (English), kolokolo kahakai (Hawaiian, Hawaii), chasteberry (English), pohinahina (Hawaiian, Hawaii), mawanawana (Hawaiian, Hawaii), beach vitex (English), polinalina (Hawaiian, Hawaii), hinahina kolo (Hawaiian, Hawaii), man hyung ja (English, Korea), manawanawa (Hawaiian, Hawaii), cloister pepper (English), monk's pepper (English), hamago (English, Japan)

**Synonym** *Vitex ovata* , (Thunb.)  
*Vitex trifolia* , var. *simplicifolia* (Cham.)  
*Vitex agnus-castus* , var. *ovata* (Thunb.) Makino  
*Vitex trifolia* , subsp. *litoralis* Steenis  
*Vitex trifolia* , var. *obovata* Bentham  
*Vitex trifolia* , var. *ovata* (Thunb.) Makino  
*Vitex trifolia* , var. *ovata* (Thunb.) Merrill  
*Vitex trifolia* , var. *unifoliata* Schauer  
*Vitex trifolia* , var. *repens* Ridley  
*Vitex repens* , Blanco

**Similar species** *Amaranthus pumilus*, *Cakile edentula* ssp. *harperi*, *Croton punctatus*, *Iva frutescens*, *Iva imbricata*, *Morella cerifera*

**Summary** *Vitex rotundifolia*, also commonly known as beach vitex, is a perennial woody shrub of coastal sand dunes of Asia and the Pacific islands. It has been introduced into the United States where it is an invasive exotic plant. *Vitex rotundifolia* has a strong impact on the native flora and fauna along the United States Carolina coast, shading native plants and disrupting nesting sites for sea turtles. Active community involvement and strategic mapping and eradication efforts are underway to limit the extent and impact that this exotic species has on the coasts of the Carolinas and prevent it from spreading into a wider geographical range.



[view this species on IUCN Red List](#)

## Species Description

*Vitex rotundifolia* is a branched deciduous shrub (Westbrooks and Brabson, 2007) that can reach heights between 0.5-1 metres and have horizontal growth up to 20m long, but more commonly has a width around 5 metres (GRI, 2006). According to Westbrooks and Brabson (2007), the branchlets are obscurely tetrangular, tomentose, stems procumbent, often rooting at the nodes, forming mats several metres in diameter, 1-3dm long. The leaves are simple obovate to suborbicular, 2-6.5cm long, 1-4.5cm wide, and an acute base. The upper surface of the leaf is pale green and densely puberulent with a greyish-white lower surface. The lower surface of the leaf is also densely tomentose, short petiolate, and apex rounded (Westbrooks and Brabson, 2007). The foliage has a spicy fragrance when crushed (HNPPD, 2001). The flowers are arranged in terminal clusters in panicles, and about 2cm long (Gresham & Neal, undated; HNPPD, 2001). The corolla is bluish-purple, densely puberulent externally, with the tube about 8mm long. The upper two lobes are 3.5mm long with the margins recurved. The lateral lobe is about 4mm long and the lower lobe is about 7mm long. The base of the lower lobe is marked by two white pilose. The stamen is exerted from the corolla. The filaments are 9-10mm long and pilose at base. The style is also exerted from the corolla and is about 12mm long. The fruit consists of a dry, globose drupe, and is about 6mm in diameter. During September-October the fruit turns from green into yellow and red-tinged. At maturity the fruit is bluish-black (Westbrooks and Brabson, 2007).

## Notes

*Vitex rotundifolia* was introduced to the southeastern United States from Korea by North Carolina State University Arboretum in the mid-1980s. It was introduced for the purpose of dune stabilisation and for ornamental use. The fruit of *V. rotundifolia* contains compounds that inhibit lung and colon cancer cells (Westbrooks and Brabson, 2007). According to Westbrooks and Brabson (2007), beach vitex meets the definition of a quarantine significant pest because it occupies a very small portion of its potential ecological range in mainland United States, and because it poses a serious threat to certain natural and biological resources (the stability of ocean front dunes and the plant and animal communities that occupy them), as well as the value of beachfront property. The pest risk potential of beach vitex listed as medium-high. Since the plant was intentionally introduced the likelihood of introduction is high. Consequences of introduction are medium due to low economic impact and serious environmental impacts (Westbrooks and Brabson, 2007).

## Lifecycle Stages

Beach vitex flowers in May in the Carolinas (Gresham, undated), but can produce flowers throughout the year in Hawaii (HNPPD, 2001). The fruits ripen and dry in the summer while the leaves begin to dry and fall off in autumn, leaving a mat of tangled stems throughout the winter (Gresham, undated). The fruits are persistent on the plant in clusters (Gresham, undated). Seed germination takes up to 3-6 months (HNPPD, 2001).

## Uses

Vitex was historically used to suppress sexual desire in women and for similar reasons became a culinary spice in monasteries, hence the common name Monk's pepper (SCNPS, undated). Some of the active chemical compounds in the plant have been linked to female hormone balance, female reproductive organs, menopause, actions on the pituitary gland, and treatment for acne (SCNPS, undated). Compounds in the plant have also been linked to inhibit lung and colon cancers (Gresham & Neal, undated). The plant was originally introduced as an erosion control and ornamental in the United States, however its negative effects on coastal species communities does not favour it for this use (SCNPS, undated). In its native range this plant makes an excellent ground cover, ornamental, and sand dune restoration plant (HNPPD, 2001). In Hawaii the flowers and seeds of the plant are used in the making of leis (HNPDD, 2001). In Japan *V. rotundifolia* is used as a cold and headache remedy. In Korea the fruit has also been used for the relief of headaches caused by upper respiratory infection. Also in Korea it has been used for the rehabilitation and landscaping in seaboard areas (Westbrooks and Brabson, 2007).



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FULL ACCOUNT FOR: *Vitex rotundifolia*

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## Habitat Description

*Vitex rotundifolia* is an obligate sand dune species (Kim, 2005). It is found at low elevations on beaches, sand dunes, and rocky shorelines (HNPPD, 2001). Beach vitex is highly salt and drought-tolerant (GRI, 2006) and grows best in full sun and sandy or well-drained soils (SCNPS, undated). According to Madsen, *et al.*, (2005), the plant can survive in five U.S. hardiness zones, which increases the likelihood that this plant may spread to a much wider climatic and geographical range in the United States than it currently occupies.

## Reproduction

*Vitex rotundifolia* reproduces by seed and vegetatively. The plant is a prolific seed producer with estimated seed crops of 22,000 seed/square metres, with field tests resulting in 30% germination (Gresham & Neal, undated). Beach vitex can spread vegetatively through rooting at leaf nodes along runners that can reach lengths of up to 20 metres (GRI, 2006). The seed can be spread by birds eating the fruits while both the seed and stem fragments are dispersed by waves and high tides (GRI, 2006, FWS, undated).

## General Impacts

*Vitex rotundifolia* is considered an invasive species in the Carolinas and has the potential to spread to many more coastal communities along the shores of the United States (Madsen, *et al.*, 2005). Beach vitex is a rapidly growing and sprawling shrub both vertically and horizontally that is very tolerant of salt and drought (Gresham & Neal, undated). Beach vitex produces a large seed bank and can reproduce vegetatively through rooting at leaf nodes along runners (Gresham & Neal, undated). The impact of its aggressive growth pattern leads to little light reaching the soil surface where it dominates as monocultures preventing native species from establishing (Gresham & Neal, undated). In addition it has been suggested from scientific observations that the plant releases some allelopathic compounds that have actions in the soil to make it hydrophobic, causing drought stress to less tolerant native species (Gresham & Neal, undated). The structure of the plant's root system does not make it an ideal dune stabiliser compared to fibrous root systems of native species causing higher rates of dune erosion (SCNPS, undated). It causes mortality in young sea turtles by entangling them in its long runners and impacts nesting sites for reproductive females (SCNPS, undated) (please see impact information in the North and South Carolina distribution records). Beach vitex also impacts multi-million dollar beach renourishment projects (Madsen, *et al.*, 2005).



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## Management Info

**Preventative measures** Currently federal, state, and local government, academic and non-profit organisations are attempting to get *Vitex rotundifolia* listed as a Federal Noxious Weed which would prohibit the sale and transport of the species in the country unless with a permit (Madsen, *et al*, 2005). Getting the species listed would also help promote eradication programmes and monitoring of new populations if they arise (Madsen, *et al*, 2005). Other measures that have been in effect are publications through non-profits, cooperative extensions, and government agencies on identification and how the public can report sightings and locations of populations (Sea Grant NC, 2006).

**Physical** Hand-pulling, digging, and the use of machinery are all options that can be used to remove beach vitex, however due to the fragile nature of the dunes and the risk of erosion these methods should be used with caution (Gresham & Neal, undated; SCNPS, undated). Any mechanical methods to remove the plant should be thorough to make sure that the root ball or any stem fragments are not left behind to reestablish (Sea Grant NC, 2006). Mechanical methods to reduce the seed and stem fragments from spreading are to clip any flowering or fruiting stems and gently remove any long seaward runners (FWS, undated). Any beach vitex plant material should be sealed in plastic bags and taken to a landfill rather than mulched or composted as plant parts can reestablish (FWS, undated).

**Chemical** Several different techniques of herbicide application are being tested on beach vitex. Three different techniques can be used to apply a herbicide to the plant. One method is to cut the aboveground vegetation back to a stump and then apply a glyphosate paint to the exposed cut (Sea Grant NC, 2006; Grisham, undated). The second method is to wound the stem and then apply a herbicide to the wound (Sea Grant NC, 2006). The third method is to apply an oil based herbicide mixture to the stem in a 30-45cm length band at the base of the stem (Sea Grant NC, 2006). Herbicides should be selected carefully and used with caution as well as in appropriate amounts due to the sensitivity of the area and its proximity to the ocean (Sea Grant NC, 2006).

**Cultural** Revegetation with native grass and dune species should be incorporated into any control program to prevent erosion and recolonization (Gresham, undated).

## Pathway

Beach vitex was mainly introduced into the United States for dune stabilization and coastal erosion control (Madsen, *et al*, 2005). *Vitex rotundifolia* was introduced into the United States partly as an ornamental plant (Madsen, *et al*, 2005) and is still being sold in nurseries in Texas, Virginia, and Alabama (SCNPS, undated).

**Principal source:** Gresham, C.A., & Neal, A., undated, An Evaluation of the Invasive Potential of Beach Vitex (*Vitex rotundifolia*)

Madsen, J.D., Abbott, C., Brown, R., Bruce, L., Byrd, Jr., J., Dibble, E., Ervin, G., Fowler, J., Maddox, V., & Shaw, D., Dec. 2005, Research to Support Integrated Management Systems of Aquatic and Terrestrial Invasive Species, Annual Report Mississippi State University GeoResources Institute in collaboration with United States Geological Survey

Sea Grant North Carolina, 2006, Beach Vitex: Kudzu of the Coast?, Coastwatch Spring 2006, National Sea Grant College Program.

**Compiler:** National Biological Information Infrastructure (NBII) & IUCN/SSC Invasive Species Specialist Group (ISSG)

**Review:** Expert review underway: Dr. Randy G. Westbrooks \ USGS BRD\ Whiteville, North Carolina\ USA

**Publication date:** 2007-05-14

## ALIEN RANGE

[5] UNITED STATES

**Red List assessed species 5: CR = 3; EN = 2;**

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# GLOBAL INVASIVE SPECIES DATABASE

FULL ACCOUNT FOR: *Vitex rotundifolia*

[Caretta caretta](#) EN  
[Dermochelys coriacea](#) CR  
[Lepidochelys kempii](#) CR

[Chelonia mydas](#) EN  
[Eretmochelys imbricata](#) CR

## BIBLIOGRAPHY

21 references found for *Vitex rotundifolia*

### Management information

[Carolinas Beach Vitex Task Force, 2006. Press Release. Carolina s Beach Vitex Task Force Announces Eradication Grant.](#)

**Summary:** Available from: <http://www.scnps.org/PDFs/BeachVitexPressRelease8-3-06.pdf> [Accessed 24 April, 2007]

[Gresham, C.A., & Neal, A., undated, An Evaluation of the Invasive Potential of Beach Vitex \(\*Vitex rotundifolia\*\), The Belle W. Baruch Institute of Coastal Ecology and Forest Science, Clemson University, Georgetown, SC, 29442.](#)

**Summary:** A technical article that was commonly referenced in other literature on beach vitex. This article had in depth analysis on the impacts of beach vitex on native plant communities and the invasiveness of its growth habit along with other basic ecology and biology. Available from: [http://www.northinlet.sc.edu/resource/vitex\\_files/aug04/VITEX%20manuscript\\_%2011-17.pdf](http://www.northinlet.sc.edu/resource/vitex_files/aug04/VITEX%20manuscript_%2011-17.pdf) [Accessed on 3 April 2007].

[Gresham, C.A., undated, Identifying and Managing Beach Vitex, Fact sheet HGIC 2315, Clemson Extension Home and Garden Information Center, Clemson University Cooperative Extension Service.](#)

**Summary:** An article describing the impact of beach vitex, some native species it can be confused with, as well as how to eradicate and report the species to agencies.

Available from: <http://hgic.clemson.edu/factsheets/HGIC2315.htm> [Accessed on 3 April 2007].

[Madsen, J.D., Abbott, C., Brown, R., Bruce, L., Byrd, Jr., J., Dibble, E., Ervin, G., Fowler, J., Maddox, V., & Shaw, D., Dec. 2005, Research to Support Integrated Management Systems of Aquatic and Terrestrial Invasive Species, Annual Report Mississippi State University GeoResources Institute in collaboration with United States Geological Survey.](#)

**Summary:** An annual report on invasive species with an article on establishing beach vitex as a federally listed noxious weed as well as brief ecology, dispersal and impact of the plant on the environment.

Available from: <http://www.ece.msstate.edu/~fowler/Publications/Papers/MAB2006.pdf> [Accessed on 3 April 2007].

[Sea Grant North Carolina, 2006, Beach Vitex: Kudzu of the Coast?, Coastwatch Spring 2006, National Sea Grant College Program.](#)

**Summary:** An article discussing the impact of beach vitex on the Carolina coasts with indepth chemical management options for eradication.

Available from: <http://www.ncseagrant.org/index.cfm?fuseaction=story&pubid=140&storyid=214> [Accessed on 3 April 2007].

[USDA-NRCS Plants profile \*Amaranthus pumilus\* Raf.](#)

**Summary:** Available from: <http://plants.usda.gov/java/nameSearch?keywordquery=Amaranthus+pumilus+&mode=sciname> [Accessed 24 April 2007]

[U.S. Fish and Wildlife Service \(FWS\), undated, Beach Vitex Invades the Carolina Coast Threatening Native Dune Plants and Sea Turtles, in collaboration with U.S. Geological Survey\(USGS\), South Carolina Beach Vitex Task Force \(SCBVTF\), \[online poster\].](#)

**Summary:** U.S. Fish and Wildlife poster with brief basic information on how to identify and report sightings of beach vitex and how it can spread along the coast.

Available from: <http://www.fws.gov/nc-es/port/BeachVitexposter.pdf> [Accessed on 3 April 2007].

### General information

[GeoResources Institute\(GRI\), 2006, Invasive Species Beach Vitex \(\*Vitex rotundifolia\* L.f.\), Mississippi State University, Mississippi State, MS, 39762.](#)

**Summary:** A webpage that gives some basic public information on the impact and description of beach vitex.

Available from: <http://hgic.clemson.edu/factsheets/HGIC2315.htm> [Accessed on 3 April 2007].

[Hawaiian Native Plant Propagation Database \(HNPPD\), 2001, \*Vitex rotundifolia\*, College of Tropical Agriculture and Human Resources, University of Hawaii Manoa \[online\].](#)

**Summary:** A native plant propagation database used for information on habitat, description, uses, and Hawaiian names associated with beach vitex.

Available from: <http://www2.hawaii.edu/~eherring/hawnprop/vit-rotu.htm> [Accessed on 3 April 2007].

[ITIS \(Integrated Taxonomic Information System\), 2007. Online Database \*Vitex rotundifolia\*](#)

**Summary:** An online database that provides taxonomic information, common names, synonyms and geographical jurisdiction of a species. In addition links are provided to retrieve biological records and collection information from the Global Biodiversity Information Facility (GBIF) Data Portal and bioscience articles from BioOne journals.

Available from: : [http://www.itis.gov/servlet/SingleRpt/SingleRpt?search\\_topic=TSN&search\\_value=505725](http://www.itis.gov/servlet/SingleRpt/SingleRpt?search_topic=TSN&search_value=505725) [Accessed on 3 April 2007]

Kim, K.D., 2005, Invasive plants on disturbed Korean sand dunes, *Estuarine, Coastal, and Shelf Science*, Vol. 62, pp. 353-364.

**Summary:** A journal article briefly discussing beach vitex in its native range in Korea. Cited for its mention of beach vitex being native to Korea.

[Marine Turtle Specialist Group 1996. \*Caretta caretta\*. In: IUCN 2006. 2006 IUCN Red List of Threatened Species.](#)

**Summary:** The IUCN Red List of Threatened Species provides taxonomic, conservation status and distribution information on taxa that have been globally evaluated using the IUCN Red List Categories and Criteria. This system is designed to determine the relative risk of extinction, and the main purpose of the IUCN Red List is to catalogue and highlight those taxa that are facing a higher risk of global extinction (i.e. those listed as Critically Endangered, Endangered and Vulnerable). The IUCN Red List also includes information on taxa that are categorized as Extinct or Extinct in the Wild; on taxa that cannot be evaluated because of insufficient information (i.e. are Data Deficient); and on taxa that are either close to meeting the threatened thresholds or that would be threatened were it not for an ongoing taxon-specific conservation programme (i.e. are Near Threatened).

Available from: <http://www.iucnredlist.org/>

This page available from: <http://www.iucnredlist.org/search/details.php/3897/all> [Accessed 24 April 2007]

Global Invasive Species Database (GISD) 2024. Species profile *Vitex rotundifolia*. Available from:

<https://iucngisd.org/gisd/species.php?sc=1110> [Accessed 27 July 2024]



# GLOBAL INVASIVE SPECIES DATABASE

FULL ACCOUNT FOR: *Vitex rotundifolia*

[Marine Turtle Specialist Group 1996. \*Lepidochelys kempii\*. In: IUCN 2006. 2006 IUCN Red List of Threatened Species](#)

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Available from: <http://www.iucnredlist.org/>

This page available from: <http://www.iucnredlist.org/search/details.php/11533/all> [Accessed 24 April 2007]

[National Estuarine Research Reserve, undated, About Beach Vitex, North Inlet-Winyah Bay Reserve, Georgetown, SC, 29442.](#)

**Summary:** This website has a brief description of beach vitex and its impact and was cited for distribution.

Available from: [http://www.northinlet.sc.edu/resource/plant\\_information.htm](http://www.northinlet.sc.edu/resource/plant_information.htm) [Accessed on 3 April 2007].

[Porcher, M.H., et al, 2004, Multilingual Multiscript Plant Name Database, Institute of Land and Food Resources, The University of Melbourne, Australia, \[online\].](#)

**Summary:** A database on the common names of beach vitex used internationally.

Available from: <http://www.plantnames.unimelb.edu.au/Sorting/Vitex.html#rotundifolia> [Accessed on 3 April 2007].

[Red List Standards & Petitions Subcommittee 1996. \*Eretmochelys imbricata\*. In: IUCN 2006. 2006 IUCN Red List of Threatened Species.](#)

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Available from: <http://www.iucnredlist.org/>

This page available from: <http://www.iucnredlist.org/search/details.php/8005/all> [Accessed 24 April 2007]

[Sarti Martinez, A.L. 2000. \*Dermodochelys coriacea\*. In: IUCN 2006. 2006 IUCN Red List of Threatened Species.](#)

**Summary:** The IUCN Red List of Threatened Species provides taxonomic, conservation status and distribution information on taxa that have been globally evaluated using the IUCN Red List Categories and Criteria. This system is designed to determine the relative risk of extinction, and the main purpose of the IUCN Red List is to catalogue and highlight those taxa that are facing a higher risk of global extinction (i.e. those listed as Critically Endangered, Endangered and Vulnerable). The IUCN Red List also includes information on taxa that are categorized as Extinct or Extinct in the Wild; on taxa that cannot be evaluated because of insufficient information (i.e. are Data Deficient); and on taxa that are either close to meeting the threatened thresholds or that would be threatened were it not for an ongoing taxon-specific conservation programme (i.e. are Near Threatened).

Available from: <http://www.iucnredlist.org/>

This page available from: <http://www.iucnredlist.org/search/details.php/6494/all> [Accessed 24 April 2007]

[Seminoff, J.A. 2004. \*Chelonia mydas\*. In: IUCN 2006. 2006 IUCN Red List of Threatened Species](#)

**Summary:** The IUCN Red List of Threatened Species provides taxonomic, conservation status and distribution information on taxa that have been globally evaluated using the IUCN Red List Categories and Criteria. This system is designed to determine the relative risk of extinction, and the main purpose of the IUCN Red List is to catalogue and highlight those taxa that are facing a higher risk of global extinction (i.e. those listed as Critically Endangered, Endangered and Vulnerable). The IUCN Red List also includes information on taxa that are categorized as Extinct or Extinct in the Wild; on taxa that cannot be evaluated because of insufficient information (i.e. are Data Deficient); and on taxa that are either close to meeting the threatened thresholds or that would be threatened were it not for an ongoing taxon-specific conservation programme (i.e. are Near Threatened).

Available from: <http://www.iucnredlist.org/>

This page available from: <http://www.iucnredlist.org/search/details.php/4615/all> [Accessed 24 April 2007]

[South Carolina Native Plant Society \(SCNPS\), undated, Hawaiian Plant Threatens South Carolina Dunes, \[online article\].](#)

**Summary:** An article with not a lot of citation information so it was listed as grey literature. The article was cited for impacts and uses of beach vitex.

Available from: <http://www.scnps.org/PDFs/vitex.pdf> [Accessed on 3 April 2007].

[USDA, ARS, 2007. \*Vitex rotundifolia\*. National Genetic Resources Program, Germplasm Resources Information Network- \(GRIN\) \*Vitex rotundifolia\* \[online database\], National Germplasm Resources Laboratory, Beltsville, Maryland.](#)

**Summary:** The USDA-GRIN site was used for its records on native distribution of beach vitex.

Available from: <http://www.ars-grin.gov/cgi-bin/npgs/html/taxon.pl?41839> [Accessed on 3 April 2007].

[Westbrooks, R.G., E.C. Brabson. 2007. Weed Risk Assessment for Beach Vitex \(\*Vitex rotundifolia\* L.f.\) in the United States. United States Geological Survey - Carolinas Beach Vitex Task Force.](#)

**Summary:** Gives the ecology, distribution, and potential risks associated with the spreading of beach vitex.