

## *Gunnera manicata*

**System:** Terrestrial

Kingdom	Phylum	Class	Order	Family
Plantae	Magnoliophyta	Magnoliopsida	Haloragales	Gunneraceae

<b>Common name</b>	Brazilian rhubarb (English), Brazilian giant-rhubarb (English), giant rhubarb (English), giant gunnera (English), Chilean rhubarb (English), poor man's umbrella (English, Ecuador), parasol de los pobres (Spanish)
<b>Synonym</b>	<i>Gunnera brasiliensis</i> , Schindl.
<b>Similar species</b>	<i>Gunnera tinctoria</i> , <i>Gunnera morae</i>
<b>Summary</b>	<i>Gunnera manicata</i> is a rhizomatous perennial native to Brazil. Its large size (up to 3 m), and distinctive leaves makes it attractive to gardeners and it is widely planted for ornamental reasons. While the invasiveness of <i>G. manicata</i> is unknown in many regions, its similarity to weedy <i>G. tinctoria</i> makes it a target for control, along with <i>G. tinctoria</i> . Further to this, <i>G. tinctoria</i> plants are sometimes sold under the name <i>G. manicata</i> . <i>Gunnera</i> are the only known angiosperms to have a symbiosis with nitrogen-fixing cyanobacteria, a relationship that gives <i>G. manicata</i> plants the ability to fulfil their own nitrogen needs. This may contribute to its invasiveness.



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

## Species Description

*Gunnera manicata* belongs to the *Gunnera* subgenus *Panke* (Mol.) Schindl. which includes 20-40 species. The subgenus includes large, sometimes gigantic plants with short and stout erect stems. Leaves of plants in this group are mostly deeply, often palmately lobed. The stem is covered by large, triangular, often frilled scales. Large inflorescences bear hermaphroditic flowers (Wanntorp *et al.*, 2001).

*G. manicata* is a large, herbaceous clump-forming perennial that grows up to 3 m in height and spreads up to 4 m. Leaves are deep green, round to kidney-shaped, pleated and can grow up to 2.5 m long and 2 m wide (Carter *et al.*, 2007; Huxley, 2001). Leaves are palmately lobed, sharply toothed and have very prominent, prickly veins underneath (Huxley, 2001). Stems are long (up to 2.5m) and have short, rubbery prickles that are reddish in colour. Rhizomes are stout and horizontal, and house cyanobacteria.

*G. manicata* flowers in summer on stiff, straight and closely branches conical panicles 1-2 m. Flowers are minute, epigynous and green or rusty red in colour. *G. manicata* exhibits a combination of perfect and unisexual flowers (Wanntorp & Klackenberg, 2006). Fruit are drupes, 2-3 mm, red-green in colour rounded and barely fleshy (Huxley, 2001).

The bracts of *G. manicata*, which are a diagnostic feature, are up to 12 cm long, whitish green in colour and are very thin. Apart from the veins, the bracts are transparent when dry and deeply lacinate with long lobes also from near the base. These primary lobes (lacinae) are often one third to half the length of the bract and are in their turn laciniately divided into secondary lobes with fimbriate margins. Only the adaxial side of the bract is hairy (Wanntorp & Klackenberg, 2006).

## Notes

*Gunnera manicata*: Brazilian or Colombian?: While the commonly cultivated *G. manicata* originates from Brazil, in the past the name '*Gunnera manicata*' has been misapplied to a Gunneraceae from Colombia (Stapf 1919; Wanntorp *et al.* 2002a). In 2002 Wanntorp *et al.* made use of molecular and phylogenetic analyses to confirm that the Brazilian *G. manicata* and the Colombian '*G. manicata*' were not the same species (Wanntorp *et al.* 2002a). The Colombian *Gunnera* was subsequently named *G. morae* L. Wanntorp & Klackenberg (Wanntorp & Klackenberg 2006).

*G. manicata* author citations: Two different authorities have been given for *G. manicata*, 'Linden ex André' and 'Linden ex Delchevalerie'. Validation of Linden's plant was carried out in 1867 by Delchevalerie and in 1873 by André. Nevertheless, both names are in common use (Shaw 2007; Stapf 1919).

In New Zealand *G. manicata* is poorly differentiated from *G. tinctoria*, with both often referred to as "Chilean rhubarb". While *G. tinctoria* is widely naturalised in New Zealand and a problematic weed of conservation land (Williams *et al.*, 2005), *G. manicata* is cultivated but is not established in the wild (C. Howell, pers. comm.). Management plans of several regional councils do not make the distinction between the two species when recommending control options (Environment Waikato, 2010; Taranaki Regional Council, Undated; Horizons Regional Council, 2007).

## Uses

*Gunnera manicata*'s large size (up to 3m), and distinctive leaves makes it attractive to gardeners and it is widely planted for ornamental reasons.

## Habitat Description

*Gunnera manicata* is able to grow in a wide range of climates and soil conditions. However, if winter conditions are severe *G. manicata* may die down - new leaves then grow in spring. *G. manicata* is tolerant of salt spray and is often grown near permanent water sources in areas with low rainfall. (Osborne *et al.* 1991; TRC undated).

## Reproduction

*Gunnera manicata* flowers are borne on a long stalk (up to 1m long). Inflorescences are mainly bisexual, are both symmetric and assymetric and have well-developed sepals and petals. Staminate and pistillate flowers are located in different parts of the inflorescence. Flowers are then followed by tiny, globular (or slightly compressed) fruit. Fruit is abundant, with each seedhead producing an excess of 80,000 seeds. Wind pollinated (Environment Waikato 2010; TRC undated; Wanntorp & Ronse De Craene 2005; Wilkinson & Wanntorp 2007).

## General Impacts

*Gunnera manicata* can reduce natural biodiversity and compete with native species. The large leaves of *G. manicata* can prevent native species from growing underneath them and it may also form dense stands. *Gunnera* are the only known angiosperms to have a symbiosis with nitrogen-fixing cyanobacteria (Johansson & Bergman 1994). Unlike most symbioses between plants and cyanobacteria, in the case of the Gunneraceae the cyanobacteria are located intercellularly (Bergman 2002). The nitrogen fixing ability the cyanobacteria impart *Gunnera* species, makes the dicot nitrogen-independent (Osborne & Sprent 2002). This may contribute to the invasiveness of the Gunneraceae *G. manicata* and *G. tinctoria* since the symbiosis can fulfil the plants' nitrogen needs in nitrogen-deficient soils, especially during early stages of growth (Osborne *et al.* 1991). This could also give these Gunneraceae an advantage over native species.

## Management Info

While the invasiveness of *Gunnera manicata* is unknown in many regions, its similarity in appearance to weedy *G. tinctoria* makes it a target for control, along with *G. tinctoria* (ARC 2008; Environment Waikato 2010; Harris & Skilton 2007; NPPA 2008; TRC 2010).

*G. manicata* can be removed mechanically, but care must be taken to remove the whole rhizome, as the plant can resprout from fragments. Smaller plants can be treated with herbicide, and a combination of physical and chemical measures can be used on larger specimens. Follow up monitoring of areas and treatment of any seedlings or resprouting is recommended. (Harris & Skilton 2007; Williams *et al.* 2005).

## Principal source:

**Compiler:** IUCN SSC Invasive Species Specialist Group (ISSG) with support from the Auckland Regional Council (ARC)

**Review:** Clayson Howell, Department of Conservation

**Pubblcation date:** 2010-09-24

## ALIEN RANGE

[2] AUSTRALIA

[1] IRELAND

[1] SWITZERLAND

[1] GERMANY

[7] NEW ZEALAND

[1] UNITED KINGDOM

## BIBLIOGRAPHY

36 references found for *Gunnera manicata*

### Managment information

Amazon UK 2010. *Gunnera manicata* Seeds x 1 Packet FREEPOST UK.

[Chatham Islands Council, 2006. Regional Pest Management Strategy - Part II: Pest management programmes.](#)

**Summary:** Available from: <http://www.cic.govt.nz/pdfs/rpms06/Part2.pdf> [Accessed 13 July 2010]

eBay 2010. Giant Rhubarb *Gunnera manicata* Dinosaur 2 ft PLANT.

eBay Australia 2010. *Gunnera manicata* seed Giant Rhubarb .

[Environment Waikato 2010. Chilean rhubarb \(\*Gunnera tinctoria\* and \*G. manicata\*\). Pest management programmes.](#)

**Summary:** Available from:

<http://www.ew.govt.nz/policy-and-plans/Regional-Pest-Management-Strategy/Regional-Pest-Management-Strategy-2008-2013/Part-2/5-Pest-plants/54-Potential-pest-plants/544-Chilean-rhubarb-Gunnera-tinctoria-and-G-manicata/> [Accessed 13 July 2010]

[Harris S., Skilton D. 2007. Cost benefit analysis of selected pest organisms. A report prepared for Environment Waikato.](#)

**Summary:** Available from: <http://www.ew.govt.nz/PageFiles/12275/S72FinalReport19June07.PDF> [Accessed July 15 2010]

[Horizons Regional Council, 2007. Regional Pest Plant Management Strategy.](#)

**Summary:** Available from:

<http://www.horizons.govt.nz/assets/publications/managing-our-environment/publications-plans-and-strategies/OPERATIVE-RPPMS-September-2007.pdf> [Accessed 13 July 2010]

[National Pest Plant Accord \(NPPA\) 2008. Technical advisory group assessment of national pest plant accord species. Biosecurity New Zealand.](#)

**Summary:** Available from: [http://www.biosecurity.govt.nz/files/regs/imports/risk/nppa\\_tag\\_assessment.pdf](http://www.biosecurity.govt.nz/files/regs/imports/risk/nppa_tag_assessment.pdf) [Accessed 13 July 2010]

Taranaki Regional Council, undated. Giant gunnera - pest plant management.

Williams P.A., Ogle C.C., Timmins S.M., La Cock G.D., Clarkson J. 2005. Chilean rhubarb (*Gunnera tinctoria*): biology, ecology and conservation impacts. New Zealand DOC Research and Development Series 210

### General information

[Alien Plants in Ireland, 2008. \*Gunnera manicata\* Linden ex Andr](#)

**Summary:** Available from: [http://www.biochange.ie/alienplants/result\\_species.php?species=483&lang=latin&p=i](http://www.biochange.ie/alienplants/result_species.php?species=483&lang=latin&p=i) [Accessed 16 August 2010]

Bergman B. 2002. The *Nostoc-Gunnera* Symbiosis. In: A.N. Rai, B. Bergman, U. Rasmussen (eds) Cyanobacteria in symbiosis. Springer.

[Carter, S., Becker, C. & Lilly, B. 2007. Perennials: the gardener's reference. Timber Press Inc.: Portland, Oregon](#)

**Summary:** Available from:

[http://books.google.co.nz/books?id=JA9TQI8n8\\_MC&pg=PA240&dq=gunnera+manicata+botany&hl=en&ei=9baSTO3IMYf0swPdtPDkCQ&sa=X&oi=book\\_result&ct=result&resnum=7&ved=0CEkQ6AEwBg#v=onepage&q&f=false](http://books.google.co.nz/books?id=JA9TQI8n8_MC&pg=PA240&dq=gunnera+manicata+botany&hl=en&ei=9baSTO3IMYf0swPdtPDkCQ&sa=X&oi=book_result&ct=result&resnum=7&ved=0CEkQ6AEwBg#v=onepage&q&f=false) [Accessed 24 September, 2010]

[Duretto M.F. 2009. Gunneraceae. Flora of Tasmania Online.](#)

**Summary:** Available from: [http://demo1.tmag.tas.gov.au/treatments/families/Gunneraceae/Gunneraceae\\_2009\\_1.pdf](http://demo1.tmag.tas.gov.au/treatments/families/Gunneraceae/Gunneraceae_2009_1.pdf) [Accessed 13 July 2010]

Huxley, A. 2001. The New Royal Horticultural Society dictionary of gardening. Palgrave MacMillan.

[Integrated Taxonomic Information System \(ITIS\) 2010. Gunnera L.](#)

**Summary:** Available from: [http://www.itis.gov/servlet/SingleRpt/SingleRpt?search\\_topic=TSN&search\\_value=27057](http://www.itis.gov/servlet/SingleRpt/SingleRpt?search_topic=TSN&search_value=27057) [Accessed 13 July 2010]  
Johansson & Bergman 1994. Reconstitution of the symbiosis of *Gunnera manicata* Linden: cyanobacterial specificity. New Phytologist 126: 643-652.

[Mahon, D.J. 2007. Canterbury naturalised vascular plant checklist. Canterbury Conservancy, Department of Conservation.](#)

**Summary:** Available from:

<http://www.doc.govt.nz/upload/documents/conservation/threats-and-impacts/weeds/canterbury-naturalised-plants.pdf> [Accessed 17 September, 2010]

MikhaylovichKozo-Polyansky, B., Fet, V. & Margulis, L. 2010. Symbiogenesis: A New Principle of Evolution.

[Non-Native Species Secretariat \(NNSS\) undated. Giant-rhubarbs.](#)

**Summary:** UK. Available from: <https://secure.fera.defra.gov.uk/nonnativespecies/downloadDocument.cfm?id=371> [Accessed 16 August 2010]

O'Brien H.E., Miadlikowska J., Lutzoni F. 2005. Assessing host specialization in symbiotic cyanobacteria associated with four closely related species of the lichen fungus *Peltigera*. European Journal of Phycology 40: 363 - 378.

Osborne B., Doris F., Cullen A., McDonald R., Campbell G., Steer M. 1991. *Gunnera tinctoria*: An unusual nitrogen-fixing invader. BioScience 41: 224-234.

Osborne & Sprent 2002. Ecology of the *Nostoc-Gunnera* symbiosis. In: A.N. Rai, B. Bergman, U. Rasmussen (eds) Cyanobacteria in symbiosis. Springer.

Pfeiffer & Voeks 2008. Biological invasions and biocultural diversity: linking ecological and cultural systems

Praeger R.L. 1939. A further contribution to the flora of Ireland. Proceedings of the Royal Irish Academy. Section B: Biological, Geological, and Chemical Science 45: 231-254

Ronse De Craene L.P., Wanntorp L. 2006. Evolution of floral characters in *Gunnera* (Gunneraceae). Systematic botany 31: 671-688.

Rutishauser R., Wanntorp L., Pfeifer E. 2004. *Gunnera herteri* ♦ developmental morphology of a dwarf from Uruguay and S Brazil (Gunneraceae). Plant Systematics and Evolution 248: 219-241.

Shaw J.M.H. 2007. A new author citation for *Gunnera manicata*, and a note on a little known botanical author. Hanburyana 2: 46♦49.

Stapf O. 1919. *Gunnera manicata* and *G. brasiliensis*. Bulletin of Miscellaneous Information (Royal Gardens, Kew) 1919: 376-378.

Taranaki Regional Council, 2010. Pest plants.

[USDA-ARS 2010. Taxon: Gunnera manicata Linden ex Delchev. National Genetic Resources Program. Germplasm Resources Information Network - \(GRIN\) \[Online Database\]. National Germplasm Resources Laboratory, Beltsville, Maryland.](#)

**Summary:** Available from: [http://www.ars-grin.gov/cgi-bin/npgs/html/tax\\_search.pl?Gunnera%20manicata](http://www.ars-grin.gov/cgi-bin/npgs/html/tax_search.pl?Gunnera%20manicata) [Accessed 13 July 2010]

[Wanntorp L., Klackenberg J. 2006. Gunnera morae \(Gunneraceae\), a new species from Colombia. Caldasia 28: 221-225.](#)

**Summary:** Available from: <http://www.icn.unal.edu.co/publicaciones/art/170/28-N2/Bot6.pdf> [Accessed 13 July 2010]

Wanntorp L., Ronse De Craene L.P. 2005. The *Gunnera* Flower: Key to Eudicot Diversification or Response to Pollination Mode? International Journal of Plant Sciences 166: 945♦953.

Wanntorp, L., Wanntorp, H.-E., Oxelman, B. & K♦llersj♦, M. 2001. Phylogeny of *Gunnera*. Plant Systematics and Evolution, 226(1-2): 85-107.

Wanntorp L., Wanntorp H.E., K♦llersj♦ M. 2002. The identity of *Gunnera manicata* Linden ex Andr♦ - Resolving a Brazilian-Colombian enigma. Taxon 51: 493-497.

Wilkinson H.P., Wanntorp L. 2007. Gunneraceae. In K. Kubitzki (ed) The Families and Genera of Vascular Plants Volume 9. Springer-Verlag.