EPPO Datasheet: *Cortaderia jubata*

Last updated: 2020-04-23

IDENTITY

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Preferred name: *Cortaderia jubata*
Authority: (Lemoine ex Carrière) Stapf
Taxonomic position: Plantae: Magnoliophyta: Angiospermae: Commelinids: Poales: Poaceae: Panicoideae
Other scientific names: *Cortaderia selloana subsp. jubata* (Lemoine) Testoni & Villamil, *Gynerium jubatum* Lemoine, *Gynerium neesii* Meyen, *Gynerium pygmaeum* Meyen
Common names: Andean pampas grass, Andes grass, Selloa grass, jubata grass, jubatagrass, pampas grass, pink pampas grass, purple pampas grass
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EPPO Categorization: A1 list
view more categorizations online...
EU Categorization: IAS of Union concern
EPPO Code: CDTJU

GEOGRAPHICAL DISTRIBUTION

History of introduction and spread

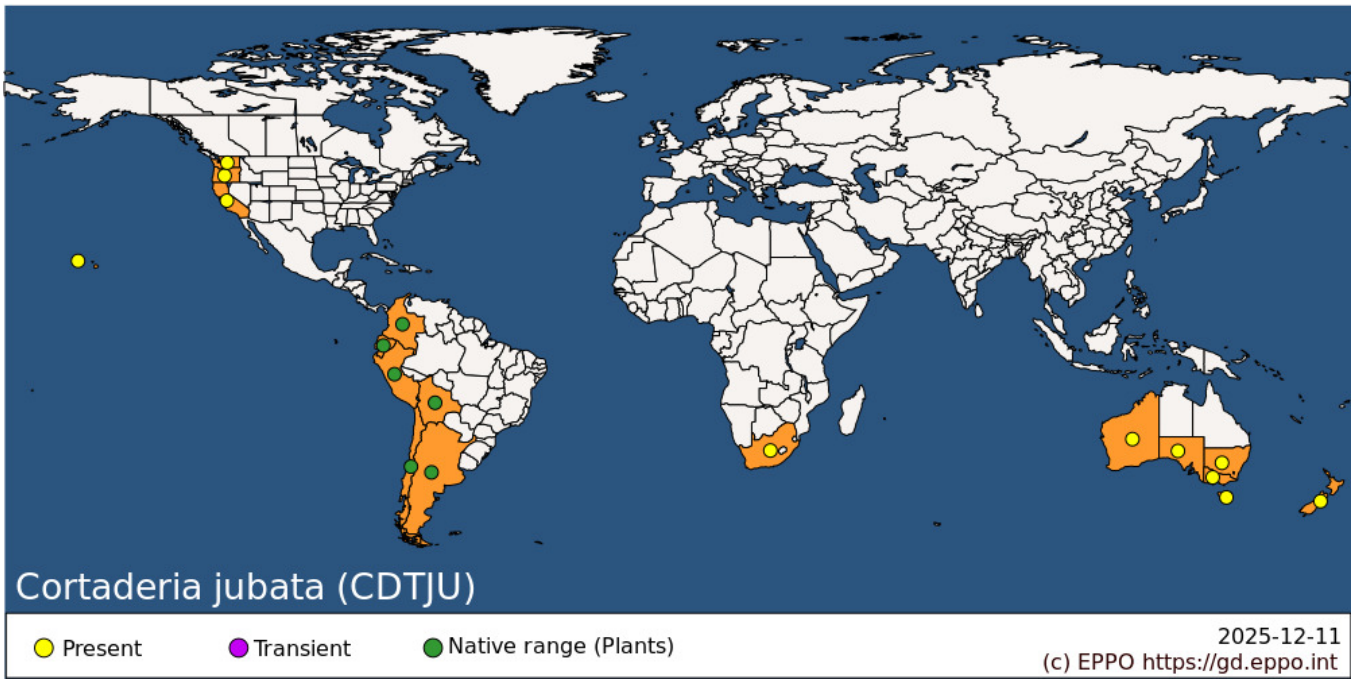
C. jubata is native to South America (Argentina, Bolivia, Chile, Colombia, Ecuador and Peru). In its native range, this species usually grows at high altitudes (about 2000–3900 m) in the Andes and is said to often form dense stands bordering high-altitude montane forests (Testoni & Villamil, 2014; Instituto de Botánica Darwinion, 2017).

C. jubata is invasive in California, Hawaii, New Zealand, Australia and South Africa, but appears to have had the largest impacts in New Zealand and California.

Pampas grass was planted for mine rehabilitation in South Africa long before it was realized that there were in fact two species (*C. jubata* and *C. selloana*) in the country, so it is highly possible that the former was introduced for this purpose as well (Robinson, 1984).

C. jubata is not present in the natural environment in the EPPO region. It was introduced into France, Ireland, Spain and the United Kingdom and cultivated but has not established (Hooker, 1898; USDA NPGS, 2017, Royal Horticultural Society, 2009).

Distribution



Africa: South Africa
North America: United States of America (California, Hawaii, Oregon, Washington)
South America: Argentina, Bolivia, Chile, Colombia, Ecuador, Peru
Oceania: Australia (New South Wales, South Australia, Tasmania, Victoria, Western Australia), New Zealand

MORPHOLOGY

Plant type

Perennial grass.

Description

C. jubata is a tall, tussock-forming grass with sharp, drooping, serrated leaves and a tall, fluffy inflorescence that is usually pink to violet in colour, but turns brown with age (Fig. 1). It is morphologically similar to *C. selloana.* The two taxa have broadly overlapping introduced ranges, with the notable exception of the EPPO region where only *C. selloana* has been reported as naturalized. Although studies using both morphological (Testoni & Linder, 2017) and genetic (Houliston & Goeke, 2017) traits have identified distinct taxonomic groupings, distinguishing individuals of the two taxa is difficult. Diagnostic traits are often subtle and only present during certain life-history stages. In addition, the validity of many diagnostic traits varies across regions in the introduced range. This might reflect the high degree of morphological variability across the native range of *C. selloana* as well as the morphological diversity of its cultivated selections.

When inflorescences are present, *C. jubata* can generally be distinguished from *C. selloana* by inflorescences that extend well above the foliage and young inflorescences that are violet hued rather than purely white or yellow as they are in *C. selloana* (Edgar & Connor, 2000; Testoni & Linder, 2017). However, individuals of both taxa appear to express a high degree of phenotypic plasticity in these traits. Regional taxonomic treatments have identified a number of other potentially discriminating traits including: leaf blades in *C. jubata* that are dark green on both sides but blue green above and dark green below in *C. selloana* (Flora of New Zealand Series, 2004); leaf tips that are not setaceous in *C. jubata* but are markedly so in *C. selloana* (Robinson, 1984); and a range of floral characteristics. However, the cross-region reliability of these diagnostic traits is not known.

BIOLOGY AND ECOLOGY

General

Only female plants of *C. jubata* are known to occur, and this species reproduces from seeds produced from unfertilized female ovules (apomixis) (Testoni & Linder, 2017). *C. jubata* is extremely fecund, producing over 100 000 seeds from a single inflorescence in one season, with an adult plant having between 5 and 20 inflorescences (Drewitz & DiTomaso, 2004). Seeds are dispersed principally by wind, but also by water and animals (Drewitz & DiTomaso, 2004; New Zealand Plant Conservation Network, 2017). Seeds buried under natural conditions remain viable for a very limited period (no longer than 4 months; Drewitz & DiTomaso, 2004).

Habitats

In its native range, *Cortaderia jubata* usually grows at high altitudes (about 2000–3900 m) in the Andes and is said to often form dense stands bordering high-altitude montane forests (Testoni & Villamil, 2014; Instituto de Botánica Darwinion, 2017).

C. jubata invades a wide variety of habitats. It is particularly known for invading disturbed/ruderal areas such as roadsides, logged forests/plantations and recently burnt vegetation (Edgar & Connor, 2000; Parsons & Cuthbertson, 2004; Robinson, 1984; Starr *et al.,* 2003). However, it is also capable of invading a number of habitats with intact vegetation, with a preference for sunnier, more open vegetation types, possibly due to increased seed germination and seedling survival in sunnier conditions (Drewitz & DiTomaso, 2004; Stanton *et al.*, 2005). Habitat associations do, however, seem to differ slightly from region to region. In California, this species is most commonly associated with disturbed habitats and then with coastal chaparral and wetlands (Fig. 2) (Peterson & Russo, 1988; Lambrinos, 2001). In New Zealand, this species appears to occupy the highest diversity of habitats from forest light gaps, slips, margins, disturbed sites, open habitats, riverbeds, cliffs, inshore and offshore islands, tussockland, fernland, herbfield, duneland, coastline, gumlands, salt marsh, estuaries and shrublands (New Zealand Plant Conservation Network, 2017). In Australia, *C. jubata* seems to be most commonly associated with disturbed habitats: roadsides, disturbed bushland (NSW Government, 2017) and burnt-over forests (Government of South Australia, 2011). In Maui, Hawaii, this species is also associated with roadsides, but has been found spreading into dry, alpine desert and moist subtropical montane forest (Loope & Medeiros, 1992). In South Africa, this species is once again associated with disturbed habitats, but also invades native grasslands (Robinson, 1984; Invasive Species South Africa, 2017).

Environmental requirements

C. jubata has a very broad environmental tolerance: it can tolerate severe drought but establishes best in wet, sandy soil without existing vegetation (Peterson & Russo, 1988) and has been shown to germinate best in high-light, warm (about 20°C) and moist conditions (Stanton *et al.*, 2005). *C. jubata* is sensitive to drought at the seedling stage (Stanton *et al.*, 2005), but is able to tolerate dry conditions as an adult plant (e.g. Loope & Medeiros, 1992). There is some indication that *C. jubata* is sensitive to frost: it did not survive horticultural trials in Ireland (Hooker, 1898), and it suffers leaf damage when frosted (Costas Lippmann, 1977; Robinson, 1984).

However, frost rarely leads to plant mortality (Costas Lippmann, 1977; Robinson, 1984). *C. jubata* grows in a wide variety of soils (Cal-IPC, 2017).

Natural enemies

There are no known natural enemies in the EPPO region.

Uses and benefits

C. jubata has been most commonly planted as an ornamental species because of its large, colourful inflorescences (e.g. Costas Lippmann, 1977). The species was trialled (2009) as an ornamental species by Wisely Gardens (RHS) in the UK (Royal Horticultural Society, 2009). In the EPPO region, the species is not currently available from nurseries. Seeds can be purchased from online suppliers from outside of the EPPO region.

It has also been used as a forage plant in New Zealand (Gadgil *et al.,* 1984). It has been suggested that this species

has also been planted ‘for shelter belts, land protection and erosion control’ (CABI, 2017). ‘Pampas grass’ was planted for mine rehabilitation in South Africa long before it was realized that there were in fact two species (*C. jubata* and *C. selloana*) in the country, so it is highly possible that the former was introduced for this purpose as well (Robinson, 1984).

PATHWAYS FOR MOVEMENT

Plants for planting are one pathway for the movement of the species. *C. jubata* has been historically planted as an ornamental in France, Ireland, the UK (Hooker, 1898; Royal Horticultural Society, 2009), Australia (Queensland Government, 2017), California (Costas Lippmann, 1977; Peterson & Russo, 1988), New Zealand (Houliston & Goeke, 2017) and South Africa (Robinson, 1984). There is no evidence that the species is promoted as an ornamental plant within the EPPO region, but it has been trialled as an ornamental species by Wisely Gardens (RHS) in the UK (Royal Horticultural Society, 2009).

C. jubata has been planted as a forage plant in California (Peterson & Russo, 1988) and New Zealand (Gadgil *et al.*, 1984). There is no evidence that the species is promoted as forage plant within the EPPO region.

IMPACTS

Effects on plants

In California, this species has been found to be able to outcompete native plants once it has established (*C. jubata* is not a good competitor at the seedling stage) (Peterson & Russo, 1988). This species produces a large amount of above- and belowground biomass that ‘allow it to acquire light, moisture, and nutrients that would be used by other plants’ (Peterson & Russo, 1988). Coastal sand dunes and inland sand hills are the most invaded habitats, and these harbour ‘a number of rare and endangered plant species’ (Peterson & Russo, 1988). A decrease in arthropod abundance and diversity is associated with vegetation change. Rodents were less common in *C. jubata*-dominated grasslands, but rabbits more common (Lambrinos, 2000).

In Hawaii, the species has been recorded as developing into ‘dense monotypic stands in mesic to humid areas with the potential to replace or compete with native species’ (Daehler, 2006).

In Australia, *C. jubata* has also been found to displace native plants (Queensland Government, 2017), although no empirical evidence has been published.

In New Zealand, this species has been found to replace ground cover, shrubs and ferns (CABI, 2017).

Environmental and social impact

This species negatively affects forestry production by competing with forestry trees and making access difficult. Because this species can form dense stands, it may also affect genetic resources, but there is no published evidence to this effect (DiTomaso *et al*., 2008; Gadgil *et al.*, (1984).

It has been suggested that this species may influence fire intensities because plants can accumulate large amounts of dead leaf material (Government of South Australia 2011); Lambrinos, 2000).

Primary production and habitat stability may be altered by *C. jubata* invasions, due to transformation of vegetation from shrublands to ‘jubata grasslands’, although this has not been investigated.

C. jubata could have negative impacts on aesthetic experiences, tourism and recreation (e.g. hiking) because it can form dense stands and because it has sharp, serrated leaves that can cut people who are walking past (Government of South Australia, 2011).

CONTROL

Manual control has been found to be an effective, but labour-intensive, method of control of *C. jubata* (DiTomaso *et al.*, 2008; Gosling *et al*., 2000; Peterson & Russo, 1988). Hand pulling is recommended for smaller plants (NSW Government, 2017; UC Weed Research & Information Center, 2017). Larger plants are more difficult to remove because of their serrated leaves, but can be dug out or mechanically removed (although this may damage surrounding vegetation (NSW Government, 2017; Starr *et al*., 2003; UC Weed Research & Information Center, 2017). Care must be taken to remove all the roots and to dispose of the plants carefully to prevent resprouting (Starr *et al.*, 2003; NSW Government, 2017; UC Weed Research & Information Center, 2017). Removal of the inflorescences prior to manual removal, and thereafter destroying these, is also highly recommend (Starr *et al.*, 2003; NSW Government, 2017; UC Weed Research & Information Center, 2017).

Chemical control is often very effective. Plant should not be stressed by drought or frost prior to spraying (NSW Government, 2017). It has also been recommended that ome manual removal of leaves is done, or the plants burnt prior to spraying, as this reduces the amount of herbicide that needs to be sprayed (NSW Government, 2017; UC Weed Research & Information Center, 2017). Follow-up spraying is often needed because mature plants, in particular, may resprout following an initial treatment (Gosling *et al*., 2000; Popay *et al.*, 2003). Chemicals can be applied via a number of different methods, including by knapsack pump, motorized spray equipment, hand application of granules, by aircraft fitted with a spray boom, or specialized spot application equipment, as well as by 'aerial gunspraying' (Gosling *et al.*, 2000). Aerial gunspraying is expensive and most often used for plants that are inaccessible by foot or in remote locations (Popay *et al.*, 2003).

C. jubata is eaten by livestock when plants are still young (NSW Government, 2017). Grazing has been used as a control measure in plantations in New Zealand (Gosling *et al*., 2000) and Australia (NSW Government, 2017), particularly for preventing seedling establishment (Muyt, 2001). Even if grazing does not kill *C. jubata* plants, it can help prevent flower development (NSW Government, 2017).

Oversowing with pasture grass species following plantation felling has been used to prevent establishment of *C. jubata* in New Zealand (Gosling *et al.*, 2000).

In New Zealand, the Sustainable Farming Fund (2011) funded a project to find biological control agents, both in New Zealand and in the native range of *C. jubata*. Bellgard *et al.* (2010) published the results of the survey for biological control agents in New Zealand, but they found no suitable agents as plant damage and mortality was minimal. In Ecuador, a black smut fungus and a fly which attacks the flowerheads have been identified as potential agents (Sustainable Farming Fund, 2011).

REGULATORY STATUS

C. jubata was included in a list of 95 invasive alien species that are likely to 'arrive, establish, spread and have an impact on biodiversity or related ecosystem services in the EU over the next decade' (Roy *et al.*, 2015). In 2016, *C. jubata* was identified as a priority for risk assessment within the requirements of Regulation 1143/2014 (Branquart *et al*., 2016; Tanner *et al*., 2017). A subsequent pest risk analysis concluded that *C. jubata* had a moderate phytosanitary risk to the endangered area (EPPO, 2018) and was added to the EPPO A1 List of pests recommended for regulation. In 2019, *C. jubata* was included on the (EU) list of species of Union concern (EU Regulation 1143/2014).

In New South Wales, Australia *C. jubata* is regulated as a weed with a 'general biosecurity duty' under the Biosecurity Act 2015. All plants listed under this legislation are regulated with a 'duty to prevent, eliminate or minimise any biosecurity risk they may pose. Any person who deals with any plant, who knows (or ought to know) of any biosecurity risk, has a duty to ensure the risk is prevented, eliminated or minimised, so far as is reasonably practicable' (New South Wales, 2015). In South Australia, *C. jubata* is listed as a 'State Alert Weed'. These 'are invasive weeds that are not known to be in South Australia, or if present, occur in low numbers in a restricted area and are still capable of being eradicated'. An Alert Weed would pose a serious threat to the State's primary industries, natural environments or human health if it became established here. All Alert Weeds are declared under the Natural Resources Management Act 2004: their transport and sale are prohibited (Sect. 175 and 177), plants must be destroyed (Sect. 182), and if found on your land their presence must be notified to NRM authorities (Sect. 180) (Government of South Australia, 2018). In Tasmania, *C. jubata* is a 'Declared Weed' under the Weed Management Act, 1999. Declared Weeds have the following relevant requirements: (1) 'A person must not import, or allow to be

imported, into the State any declared weed except with the written approval of the Secretary'; (2) 'Landowners and managers must take all reasonable measures to control the impact and spread of a declared weed'; (3) 'A person must not propagate, trade or otherwise distribute declared weeds or anything carrying declared weeds except – (I) transport for purposes of disposal and (II) sale or transport for purposes other than disposal where authorised by the Secretary'; (4) 'A declared weed must be disposed of in a manner which will not result in further infestation'; (5) 'A declared weed must be eradicated from areas of the State where this is considered feasible' (Tasmanian Government, 2018).

For New Zealand, *C. jubata* is listed on the National Pest Plant Accord, which is a statutory list as mandated by the Biosecurity Act 1993. Species on this list are not allowed to be sold, distributed or propagated (Biosecurity New Zealand, 2017).

In South Africa, control of the species is enabled by the National Environmental Management: Biodiversity (NEMBA) Act 10 of 2004. Currently *C. jubata* is listed as a 'Category 1b invasive species' on the NEMBA-mandated 'Alien and Invasive Species Lists, 2016'. Category 1b invasive species may not be imported into South Africa, grown, bred or otherwise propagated, moved or translocated in any manner, sold, traded or be given away. Category 1b species are major invaders that possibly require government support in order to be removed. The spread or allowing the spread of any Category 1b species is prohibited (NEMBA Act 10 of 2004, www.environment.gov.za).

In Hawaii, *C. jubata* is listed as a 'Noxious Weed' as defined in Chapter 152, Hawaii Revised Statutes: 'any plant species which is, or which may be likely to become, injurious, harmful, or deleterious to the agricultural, horticultural, aquaculture, or livestock industry of the State and to forest and recreational areas and conservation districts of the State, as determined and designated by the department from time to time' (Hawaii Invasive Species Council, 2018). In Colorado, this species is on the State Noxious Weed Watch List, which includes species that are 'known to be invasive in areas near Colorado but are not known to occur here or whose distribution is not yet fully understood' (www.cwma.org/noxweeds.html). In Oregon, this species is a 'B Listed Weed', which includes species that are 'a weed of economic importance which is regionally abundant, but which may have limited distribution in some counties' (Oregon Department of Agriculture, 2018). In Washington State, this species is a 'Class C Weed'. These species 'are often widespread or are of special interest to the agricultural industry'. 'The State Weed Board does not require control of' these species, but the 'State and many County Weed Boards provide information on identification and best management practices for these species', and 'a County Weed Board may require landowners to control a Class C weed if it poses a threat to agriculture or natural resources' (www.nwcb.wa.gov/washingtons-noxious-weed-laws).

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Datasheet history

This datasheet was first published in the EPPO Bulletin in 2019 and is now maintained in an electronic format in the EPPO Global Database. The sections on 'Identity' and 'Geographical distribution' are automatically updated from the database. For other sections, the date of last revision is indicated on the right.

EPPO (2019) *Cortaderia jubata* (Lemoine ex Carrière) Stapf. Datasheets on pests recommended for regulation. *EPPO Bulletin* **49**(1), 67-72. https://doi.org/10.1111/epp.12528