

Review of *Bulnesia sarmientoi* from Paraguay

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INTRODUCTION

Bulnesia sarmientoi from Paraguay was suggested for review at the 55th meeting of the SRG. *Bulnesia sarmientoi* was listed in CITES Appendix III by Argentina on 12th February 2008 (covering logs, sawn wood, veneer sheets, plywood, powder and extracts), then up-listed to Appendix II on 23rd June 2010 (with the same annotation) following a proposal from Argentina adopted at CITES CoP15 (CoP15 Prop. 42).

Trade data included in this report were downloaded from the CITES Trade Database on 21/03/2011.

REVIEW OF *BULNESIA SARMIENTOI* FROM PARAGUAY

ZYGOPHYLLACEAE

SPECIES:	<i>Bulnesia sarmientoi</i>
COMMON NAMES:	Holy wood (English), Pau santo (Portuguese), Palo santo (Spanish)
RANGE STATES:	Argentina, Bolivia, Brazil, Paraguay.
RANGE STATE UNDER REVIEW:	Paraguay
IUCN RED LIST:	Lower risk/conservation dependent
PREVIOUS EC OPINIONS:	-

TRADE PATTERNS:

The only reported direct exports of *Bulnesia sarmientoi*, since its listing in the CITES Appendices in 2008, were from Argentina (mainly of wood or wood products) and Paraguay (extract and oil). No CITES quotas have ever been published for this species.

The only reported direct trade of *B. sarmientoi* from Paraguay to the EU-27 2008-2009 consisted of 5700 kg of wild-sourced extract imported by Germany in 2009 for commercial purposes and 3420 kg of oil imported by the United Kingdom in 2009, of unspecified purpose and source. Paraguay has not submitted a CITES annual report since 2007, so this trade was reported by the importers only. In addition, the confiscation/seizure of 190 kg of oil where the exporting country was unknown was reported by Germany in 2009.

The only reported indirect trade to the EU-27 of *B. sarmientoi* originating in Paraguay 2008-2009 were re-exports via Switzerland to Germany in 2009, consisting of 380 kg of extract (reported by Germany) and 190 kg of derivatives (reported by Switzerland). All trade was in wild-sourced *B. sarmientoi* and for commercial purposes.

The only reported direct trade to countries other than the EU-27 2008-2009 consisted of 6300 kg of wild-sourced extract imported by Switzerland in 2008 and 190 kg of wild-sourced derivatives imported by Switzerland in 2009, both for commercial purposes. Again, this trade was reported by the importer only.

CONSERVATION STATUS in range states

Bulnesia sarmientoi is a large, slow-growing tree, endemic to the Gran Chaco region of central South America (Mereles and Pérez de Molas, 2008; Argentine Republic, 2010). Its distribution range was reported to extend over 1 million km², from southeastern Bolivia, into western Paraguay, a small section of southwestern Brazil, and northern Argentina (Argentine Republic, 2010). It was reported to thrive on well-structured loamy soils, occurring in isolated or continuous stands of the semi-arid

Chaco subregion (being the dominant species in some areas), with scattered individuals in other subregions (Argentine Republic, 2010).

B. sarmientoi was reported to reach 10-20 m in height and 30-80 cm diameter at breast height (d.b.h.) (Mereles and Pérez de Molas, 2008; Argentine Republic, 2010), with individuals measuring 45 cm d.b.h. estimated to be 100 years old (Giménez *et al.*, 2007). The species was reported to be able to produce new shoots from gemmiferous roots and to sprout from cut stumps, contributing to the maintenance of the population in harvested areas (Argentine Republic, 2010). Although its distribution in Gran Chaco is extensive, few individuals were reported to reach maturity (Mereles and Pérez de Molas, 2008). There was reported to be no artificial propagation of the species (Argentine Republic, 2010).

Although it was reported that there are no current quantitative population data (Argentine Republic, 2010), the species has a wide range and apparently a very large global population (IUCN and TRAFFIC, 2010). It was categorised Lower Risk/conservation dependent in 1998 (WCMC, 1998), although it was noted that this assessment needed updating.

The main threats to *B. sarmientoi* were reported to be high levels of export in recent years, in addition to large-scale forest loss driven by agricultural expansion (Argentine Republic, 2010). The remaining forests were reported to be highly fragmented and degraded due to selective logging, livestock farming and forest fires (Argentine Republic, 2010). Historical declines were reportedly driven by land-use change, rather than by harvest for international trade (IUCN and TRAFFIC, 2010).

The wood of *B. sarmientoi* was reported to be heavy, strong and resistant to decay because of its resin content, which also gives it aromatic properties (Mereles, 2006; Tvalchrelidze, 2009; IUCN and TRAFFIC, 2010; Argentine Republic, 2010). It was reported to be used for a variety of purposes including furniture, flooring, handicrafts and fence posts (Giménez *et al.*, 2007; Mereles and Pérez de Molas, 2008; Argentine Republic, 2010). The essential oil derived from *B. sarmientoi* wood was reported to be widely used in the perfume and cosmetics industry and in mosquito repellents (Giménez *et al.*, 2007; Argentine Republic, 2010). Resin derived from the residue of the distillation process was also reported to be used to produce dark varnishes and paints (PFNM, 2003; in: Giménez *et al.*, 2007). Harvest levels of the species were considered to be low up until 2002, when international demand reportedly increased, leading to industrial-scale exports from Argentina and Paraguay (Barros *et al.* 2010). Barros *et al.* (2010) considered the harvest levels of the species in 2010 to be unsustainable at the regional and local levels.

IUCN and TRAFFIC (2010) noted that no information was available on the quantities of wood needed to produce each kilogram of extract, although they noted that Jacobs (1990, cited in: Mereles and Pérez de Molas, 2008) reported that the heartwood extract content was between 3 and 4 per cent.

Following the inclusion of *B. sarmientoi* in Appendix II at CITES CoP15 (which came into effect on 23rd June 2010), Decision 15.96 was adopted to assist in the identification of specimens in trade:

- “Trading range States and importing Parties, working with the Plants Committee, should:
- a) identify the best methods for the identification of essential oil and wood;
 - b) produce identification materials and guidance;
 - c) develop appropriate annotations for identification methods;
 - d) explore whether additional species need to be listed for identification and regulation of wood and oil; and
 - e) report on progress at the 16th meeting of the Conference of the Parties and, if necessary, prepare additional proposals for that meeting.”

Range States and importing Parties were invited to provide information about the implementation of Decision 15.96, through CITES Notification No. 2010/027 and a questionnaire sent by the Scientific Authority of Mexico (PC19 Doc. 16.5 [Rev. 1]). A document prepared for the 19th meeting of

the Plants Committee, April 2011 (PC19 Doc. 16.5 [Rev. 1]), summarised the responses and concluded that:

- i. *Bulnesia sarmientoi* is traded in the form of wood and essential oil. One exporting country states that the wood is easy to identify, while the importers believe otherwise. With regard to the oil, the respondents agree that, for the time being, it is difficult to distinguish between oils from different species without having access to a laboratory;
- ii. It is clearly necessary to produce identification materials and exporters and importers are working on this;
- iii. There is agreement among exporters and importers as to the need for a definition of 'extracts' and other terms used in annotation #11; and
- iv. Some importing countries agree that there are look-alike problems with *Bulnesia arborea*. For its part, Argentina states that it is reviewing look-alike problems with *Caesalpinia paraguarensis* and some species of the genus *Tabebuia*."

It was also noted that whilst Decision 15.96 referred to "essential oil and wood", the annotation for *B. sarmientoi* does not include essential oil (#11 Designates logs, sawn wood, veneer sheets, plywood, powder and extracts). Definitions of terms used in the annotation were provided in CITES Notification No. 2010/036, to aid Parties in implementation of the Decision.

Paraguay: *B. sarmientoi* was reported to be widely distributed, being found in almost three-quarters of the Paraguayan Chaco region (Mereles, 2006), in the Departments of Alto Paraguay, Boquerón and Presidente Hayes (Mereles, 2006; Argentine Republic, 2010). The subregion containing *B. sarmientoi* was estimated to have spanned approximately 37 000 km² in 1987 (UNA/GTZ in: Argentine Republic, 2010).

The abundance of *B. sarmientoi* in Paraguayan Chaco forest was reported to range from 11 to 46 individuals/ha (Mereles and Pérez de Molas, 2008). In their survey of *B. sarmientoi* at two sites in the Department of Boquerón (plot size 100 x 100 m), Mereles and Pérez de Molas (2008) found variation in the height and size-distribution of individuals (Table 1), which they attributed to local differences in soil and microhabitat. The lack of natural regeneration from seeds was noted, despite the large amount of fruit observed, which, together with data from other studies of *B. sarmientoi* in Paraguay, led the authors to conclude that most forests of the Chaco are not optimal environments for regeneration, development or reproduction (Mereles and Pérez de Molas, 2008).

Table 1. Comparison of *Bulnesia sarmientoi* from surveys at two sites in the Department of Boquerón, Paraguay. (Source: Mereles and Pérez de Molas, 2008)

Site	Total abundance (trees/ha)	Average height (m)	Diameter class (cm)					
			10-20	21-30	31-40	41-50	51-60	>60
Estancia Erica	19	7	5	5	6	2	1	-
Estancia San Benito	20	12	-	8	11	1	-	-

One of the greatest threats to the species in Paraguay was reported to be the encroachment of agriculture (Mereles and Pérez de Molas, 2008), mostly for small-scale farming (Adamoli, J. *in litt.* in: IUCN and TRAFFIC, 2010). In 2009, the Paraguayan Chaco was reported to be being deforested at an average rate of 655 ha per day to make way for agricultural development, in particular cattle grazing (World Land Trust, 2009). Salas-Dueñas and Facetti (2007) considered deforestation and overexploitation as the main threats to the species in Paraguay. As well as local uses including construction, crafts, firewood and medicine, large lots of planed logs of *B. sarmientoi* were reported to have been observed in Paraguay, starting at a diameter at breast height of less than 10 cm (Mereles, 2006). Wood flooring was reported to have been exported in large quantities to Taiwan, Province of China (Mereles, 2006).

Mereles and Peres de Mola (2008) estimated that Paraguay produced 85 per cent of the world production of *B. sarmientoi* extract. The source of timber and extract in international trade was thought to be from forest land cleared for agriculture (Mereles, 2009 *in litt.* in: IUCN and

TRAFFIC, 2010; Argentine Republic, 2010). Mereles (2006) noted that "In principle, no evident conservation problems exist, but given the explosion in trade in the wood, coupled with the economic situation of the two countries [Argentina and Paraguay], we cannot be certain that extraction of the species is taking place according to a management plan that will ensure its sustainability."

Prior to the inclusion of *B. sarmientoi* in CITES Appendix III in 2008, Mereles (2006) reported that several shipments of *B. sarmientoi* extract had been confiscated by a European country where it was apparently being used as a substitute for CITES Appendix II-listed *Guaiacum* spp. Between September and November 2009 at Felixstowe port (UK), officers seized 13 large drums of oil of *B. sarmientoi* in three separate seizures (2375 kg). The oil was being imported from Paraguay without the requisite CITES documentation and certificate of origin (TRAFFIC, 2010). On the website of the Paraguayan Management and Scientific Authority (SEAM, 2010a), there was also a report of a seizure of a large number of logs of *B. sarmientoi* extract from the area of Limpio in July 2010, which did not have the required documentation for holding, transfer or export.

B. sarmientoi was classified as Endangered in the national Red List of Paraguay (Mereles and Pérez de Molas, 2008; SEAM, 2010b) and therefore became protected from commercial exploitation in principle through Ministerial Resolution 2534/06 (SEAM, 2006). However, the fact that land-use changes from forest to agriculture were permitted was reported to inadvertently authorise the clearing and harvest of the species (Argentine Republic, 2010).

Paraguay has a voluntary moratorium on trade in CITES Appendix II species for commercial purposes (CITES Notification No. 2003/058 last updated in CITES Notification 2011/009); however, on 22nd December 2010, Paraguay communicated to the CITES Secretariat its decision to authorize trade in essential oil and timber of *Bulnesia sarmientoi* (CITES Notification 2011/009).

Little information was found to be available regarding the management of *B. sarmientoi* in Paraguay. Mereles and Pérez de Molas (2008) advised that permanent monitoring of *B. sarmientoi* populations was needed, (particularly at extraction sites), along with greater co-ordination between the National Forest Service/Ministry of Agriculture and Livestock and the national CITES authorities.

Benítez *et al.* (2008) described the use of *B. sarmientoi* in the city of Tobatí (Department of Cordillera) for the production of handicrafts for commercial purposes. The authors noted that small amounts of wood were used, but highlighted the complete lack of control of the harvest.

B. sarmientoi was reported to be present in several protected areas in Paraguay, including: Parque Nacional Defensores del Chaco park, 713 250 ha (BirdLife International, 2011a); Parque Nacional Médanos del Chaco, 534 287 ha (BirdLife International, 2011b); around 5 per cent of the 4452 ha Cañada El Carmen Natural Reserve, where extraction of the species was reported to be increasing (Acevedo *et al.*, 2003); xerophytic forest representing 31 per cent of the 18 300 ha Toro Mocho Private Reserve (Fundación DeSdel Chaco, 2011); and Estancia Salazar Private Nature Reserve, where it is predominant in the forests of the 25 719 ha reserve (Fundación DeSdel Chaco, 2011). In total, 11 per cent of the Dry Chaco in Paraguay was thought to be within protected areas (IUCN and TRAFFIC, 2010), although funding for protection and management of protected areas was reported to have decreased in recent years, with encroachment of mechanised farming and livestock ranching reported to be an increasing threat (Catterson and Fragano, 2004).

REFERENCES:

- Acevedo, C., Vera.V., Pérez de Molas, M. M., & Sickley, T. 2003. *Una aproximación a la composición y el estado de conservación de la Biodiversidad de "Cañada El Carmen", Departamento de Boquerón, Chaco, Paraguay.* Instituto de Derecho y Economía Ambiental. IDEA - Paraguay.
- Argentine Republic. 2010. *Inclusion of Bulnesia sarmientoi in Appendix II, in compliance with the provisions of Article II, paragraph 2 (a), of the text of the Convention, and Resolution Conf. 9.24 (Rev. CoP14), Annex 2 a, paragraph A.* Consideration of proposals for amendment of Appendices I and II. Fifteenth meeting of the CITES Conference of the Parties, Doha, Qatar, 13-25 March 2010. CoP15 Prop. 42.
- Barros, M., Draque, J., Waller, T., Micucci, P., Zerbato, M. & Degano, A. 2010. Comercio y conservación del palo santo (*Bulnesia sarmientoi*) en Argentina y Paraguay. I Congreso

- Latinoamericano (IV Argentino) de Conservación de la Biodiversidad. San Miguel de Tucumán, Argentina.
- Benítez, B., Bertoni, S., González, F. & Céspedes, G. 2008. Uso artesanal de especies vegetales nativas en Tobatí, Paraguay. Aspectos botánicos y socioeconómicos. *Rojasiana* 8(1):10-25.
- BirdLife International. 2011a. *Important Bird Areas factsheet: Parque Nacional Defensores del Chaco* URL: <http://www.birdlife.org/datazone/sitefactsheet.php?id=20392> Accessed: 22 March 2011a.
- BirdLife International. 2011b. *Important Bird Areas factsheet: Parque Nacional Médanos del Chaco*. URL: <http://www.birdlife.org/datazone/sitefactsheet.php?id=20394> Accessed: 22 March 2011b.
- Catterson, T.M., & Fragano, F.V. 2004. Tropical forestry and biodiversity conservation in Paraguay: final report of a section 118/119 assessment EPIQ II Task Order NO. 1. USAID, Asunción, Paraguay.
- Fundación DeSdel Chaco. 2011. *Reservas Privadas* URL: <http://www.desdelchaco.org.py> Accessed: 21 March 2011.
- Giménez, A., Hernández, P., Gerez, R., & Spagarino, C. 2007. *Anatomía de leño y anillos de crecimiento de Palo Santo (Bulnesia sarmientoi Lorenz ex. Griseb Zygophyllaceae)*. Quebracho Revista de Ciencias Forestales. Universidad Nacional de Santiago del Estero, Argentina. N° 14: 23-35.
- IUCN and TRAFFIC. 2010. *Inclusion of Palo Santo Bulnesia sarmientoi in Appendix II with annotation #11 Designates logs, sawn wood, veneer sheets, plywood, powder and extracts*. IUCN/TRAFFIC analyses of the proposals to amend the CITES appendices. Prepared by IUCN Species Programme, SSC and TRAFFIC for the Fifteenth Meeting of the Conference of the Parties to CITES. The International Union for the Conservation of Nature, Gland, Switzerland. 236 pp.
- Mereles, F. 2006. *Status of the genus Bulnesia spp. with a view to its inclusion in CITES Appendix II*. Sixteenth meeting of the Plants Committee. Lima (Peru). PC16 Doc. 21.2 (Rev 1).
- Mereles, F. & Pérez de Molas, L. 2008. *Bulnesia sarmientoi Lorentz ex Griseb., (Zygophyllaceae): estudio de base para su inclusión en el Apéndice II de la Convención CITES*. WWF Paraguay. Lambaré, Paraguay.
- PFNM. 2003. *Dirección de Bosques, Secretaría de Ambiente y Desarrollo Sustentable*. URL: Nación. Base de Datos .
- Salas-Dueñas, D.A. & Facetti, J.F. *Biodiversidad del Paraguay. Una aproximación a sus realidades*. Fundación Moisés Bertoni, USAID, GEF/BM.
- SEAM. 2006. Resolución 2534/06 por la cual se modifica parcialmente la resolución No. 2243/06 "Por la cual se actualiza el listado de las especies protegidas de la vida silvestre en peligro de extinción". Secretaría del Ambiente, Paraguay.
- SEAM. 2010a. *Retención de gran cantidad de palo santo listos para exportar sin documentación en el momento de la intervención*. Secretaria del Ambiente, Paraguay, 14th July 2010. URL: <http://www.seam.gov.py/component/content/article/1-latest-news/248-retencion-de-gran-cantidad-de-palo-santo-listos-para-exportar-sin-documentacion-en-el-momento-de-la-intervencion.html> Accessed 30 March 2011.
- SEAM. 2010b. *Especies de flora nativa en peligro de extinción en Paraguay*. Secretaria del Ambiente, Paraguay. URL: http://www.seam.gov.py/images/stories/seam/especies_amenazadas/peligro_de_extincio_n.pdf Accessed 30 March 2011.
- TRAFFIC 2010. Seizures and prosecutions. *TRAFFIC Bulletin*, 22 (3): 129-140.
- Tvalchrelidze, N. 2009. *Oportunidades de Mercado para productos de las especies forestales del Chaco Paraguayo*. Red de Inversores y Exportaciones, Ministerio de Industria y Comercio, Presidencia de la República de Paraguay.
- WCMC. 1998. *Bulnesia sarmientoi*. In: IUCN 2010. IUCN Red List of Threatened Species. Version 2010.4. URL: <http://www.iucnredlist.org> Accessed: 21 March 2011.
- World Land Trust. 2009. *Deforestation in Paraguay: Over 1500 football pitches lost a day in the Chaco*. Conservation News 30th November 2009. URL: <http://www.worldlandtrust.org/news/2009/11/deforestation-in-paraguay-over-1500-football-pitches-lost-a-day-in-the-chaco.htm> Accessed: 22 March 2011.

