Andean Palms in Ecuadorean Cities

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1. *Trachycarpus fortunei* and *Araucaria heterophylla* in an old garden in Quito.

A surprising number of native palms are cultivated in cities in the Andes of Ecuador, lending a distinctive appearance to the urban landscape.

Wherever palms can grow outdoors, they are used as spectacular landscape elements in urban areas. However, a few species tend to be used extensively all around the world, this resulting in global homogenization at the expense of local specialities. Andean cities do not escape this trend, as *Phoenix canariensis* tends to be the most widely planted species in many places. It is true that this Mediterranean palm grows sumptuously under the Andean climate and that epiphytes often left growing on its trunk give it a distinct appearance. Other commonly planted introduced species include *Trachycarpus fortunei* (Fig. 1), *Washingtonia robusta*, and to a lesser extant *Chamaerops humilis* and *Livistona australis* (Pintaud 2004). Fortunately, palm landscaping in Andean cities is significantly enriched with native species, especially in the genera *Parajubaea* and *Ceroxylon*. As these species are difficult to grow to maturity and rarely seen outside their native regions, they do give a quite particular and remarkable touch to urban landscape in Andean cities. Moreover, they associate nicely with introduced palm species.

There are many local variations in the use of the native Andean palms, and a particular species can become truly emblematic of a town or village where its use has been specially developed. That is why we decided in this article to associate a palm and a city, with various examples from north to south of Ecuador (Fig. 2).

Ceroxylon ventricosum in Quito

Ceroxylon ventricosum is an impressive palm. It develops a bright white-waxy, prominently ringed, ventricose trunk that can reach 30 m tall and 60 cm in diameter. The large crown is dark green and has a plumose appearance (Fig. 3). The pinnae are whitish below (as in all *Ceroxylon* species), inserted in groups, spreading in different planes, and have pendulous tips.

This species grows spontaneously in SW Colombia and throughout Ecuador, mostly on western Andean slopes, between 2000 and 3000 m elevation. It is therefore perfect for Quito which is situated at 2800 m elevation. Natural populations of this species occur just 30 km to the SW of the city. The success of this species in cultivation comes from its tolerance to full sun even as a young plant and fast growth (the trunk grows more than 50 cm/year under optimal conditions). It is also reasonably tolerant of drought and air pollution, but needs a good, deep soil and some care to grow well. As a matter of fact, there are several decaying specimens struggling under harsh urban conditions in Quito.

Ceroxylon ventricosum is common but not abundant in the Ecuadorean capital. It is found in public gardens, old mansions, around churches, as well as in private yards. It is available in nurseries in the nearby village of Nayon, where most ornamentals for the Quito area are grown. The most famous planting in Quito is certainly the one in Plaza de

2. Map of Ecuador showing the location of the cities treated in this article.

3. *Ceroxylon ventricosum*, habit.

Argentina, in the north of the city (Fig. 4). *Ceroxylon ventricosum* deserves to be grown more extensively in Quito, as it is so spectacular and well-adapted.

Ceroxylon echinulatum in Sangolquí

This palm itself cannot be seen in this small colonial city located 25 km to the SW of Quito, at 2400 m elevation. *Ceroxylon echinulatum* is a subtropical species with an optimum habitat in cloud forests between 1600 and 1800 m elevation (Front Cover), and is difficult to grow in the inter-Andean corridor. However, its leaves are the object of a feverish activity around the church of Sangolquí and many similar places prior to the Palm Sunday (Fig. 5). The use of *Ceroxylon* leaves for this ceremony is extensive throughout the tropical Andes. As native palms are seriously damaged or even cut down to harvest the youngest leaves, natural populations are depleted, resulting in the endangerment of several species (Borchsenius et al. 1998, Galeano & Bernal 2005, Bernal & Galeano 2006). The leaves sold in Sangolquí come from nearby populations of *Ceroxylon echinulatum* on the NW slopes of the Ecuadorean Andes. In some places, the populations have been so depleted that adult palms can hardly be found now. This situation is not only damaging for the palm itself but also for the yellow-eared parrot (*Ognorhynchus icterotis*) and the golden-cheeked parrot (*Leptosittaca branickii*), which are associated with *Ceroxylon* and are now endangered. This problem raised serious concerns among bird conservationists in Ecuador and Colombia, and various actions are promoted by NGOs in these countries. For Easter 2007, there was a vast national campaign supported by 17 institutions and NGOs in Ecuador, to inform the public and stop the use of *Ceroxylon* for Easter ceremonies. However, the skills of the people, who weave these ceremonial items in a few minutes just prior to putting them for sale, are valuable. The best alternative to protect *Ceroxylon* and parrots, while maintaining the tradition, would be to use *Phoenix canariensis* leaves instead. *Phoenix canariensis* is abundantly planted in the Sierra of Ecuador, and plantations dedicated to leaf harvesting could easily and rapidly be established, providing a new source of income to growers. Moreover, the fine leaves of *Phoenix* allow a much more delicate and complex work than the coarse leaves of *Ceroxylon*. This activity has been developed to the level of an art in the Mediterranean region. If some Andean weavers could be trained for the use of *Phoenix* leaves by Mediterranean weavers, they would certainly consider it as a good alternative to the use of *Ceroxylon* leaves, resulting in a

4. Row of *Ceroxylon ventricosum* at Plaza de Argentina, Quito.

5 (left). The ceremonial items are weaved immediately before sale from the row leaf material in the streets of Sangolquí during the Holly Week. 6 (right). *Ceroxylon parvifrons*, robust habit in northern Peru (Photo by Fabien Anthelme, IRD).

considerable improvement for the plant, animal and human components of the problem.

Ceroxylon parvifrons in Machachi

Machachi is a highly productive agricultural center and also an ecotourist destination south of Quito. The village is surrounded by five volcanoes: Cotopaxi, the world highest active volcano (5897 m), Rumiñahui and Pasochoa on the eastern side of the Andean corridor; Corazón and Ilinizas on the western side. Pasochoa conserves natural inter-Andean forest with its distinctive flora and fauna, and Corazón, although completely bare at the top due to various anthropogenic degradations, supports montane wet forest on its Pacific slope. Among the plant species found at Pasochoa and Corazón is *Ceroxylon parvifrons*, which has been converted into the main ornamental palm in the Machachi area.

Ceroxylon parvifrons is a high altitude medium-sized species growing at an altitude up to 3500 m elevation, widespread in the Andes. It is immediately recognizable by its arching leaves with stiffly erect leaflets, a unique feature in the genus *Ceroxylon* (Back Cover). The pattern of scars on the trunk is also remarkable, and the wax cover is thin and caducous.

In the Machachi area, *Ceroxylon parvifrons* can be seen planted everywhere, both in urban and rural settings, as isolated individuals or in impressive groups. The most spectacular planting in the area is that of Hacienda Gualilagua de Lasso, where 36 centenary trees are planted in a fence-like fashion around the hacienda's garden. These palms set seeds freely, which germinate after one and half years, according to local informants. The growth rate is slow during the establishment phase, then it becomes fast in the sub-adult phase, but slows down considerably when the palm begins to flower while reaching 5 or 6 m tall. It then continues to grow slowly up to 12–15 m, forming a zigzag trunk. The contorted slender trunk is rather typical of north Ecuadorean populations. In contrast, in the south of the country and adjacent Peru, the palm is much more robust with a straight trunk and a larger crown of less prominently recurved leaves (Fig. 6).

Jubaea chilensis in Ambato

The southernmost Andean palm is commonly cultivated in the *Sierra* (Fig. 7), but never to such an extent as in Ambato, city of the central Andes of Ecuador, located at 2400 m elevation. *Jubaea chilensis* is a familiar element of the

7. A beautifully grown specimen of *Jubaea chilensis* in Conocoto, near Quito.

city's urban landscape. Ambato is the main fruit-producing sector in Ecuador, and the seeds of *Jubaea*, known as Chilean *coquitos*, are part of the production. Cultivation of *Jubaea* in Ambato is centered in and around the Mera family property, whose most prominent member was the writer Juan Leon Mera (1832–1894), author of the national hymn, novels and essays, and also a politician. In 1874, the Mera family built a mansion of typical Spanish style in a 5 ha property, which became the retreat of Juan Leon, where he wrote his masterpieces and where he finally died. It is now a museum and designated a national historical heritage, known as the *quinta de J. L. Mera*. The vast garden is planted with more than 200 native and exotic plant species, many of them rarely cultivated in Ecuador, including massive palm plantings especially of *Jubaea chilensis* and *Parajubaea cocoides*, but also *Phoenix canariensis* and *Trachycarpus fortunei* (Fig. 8). Most impressive is the concentration of Jubaeas that has no equivalent elsewhere in Ecuador. The pattern of large scale *Jubaea* planting in the *quinta* is very similar to that found in the chateaux of the Mediterranean region including avenues, line-plantings and regular planting in rows, the latter being rather surprising for a purely ornamental purpose (Pintaud 2002). Juan Leon Mera planted these *Jubaea* around the mansion when it was built in 1874, in honor of his first seven sons (he had 11 in total). In the present day, there are 63 mature specimens, one in the patio, a row of six on the left-hand side of the house, another of four on the right-hand side and a block of 52 specimens in four rows of

8. General view of the *quinta* of Juan Leon Mera with its spectacular plantings of *Jubaea* and *Parajubaea*.

9 (top). Partial view of the *Jubaea* planting in the *quinta* of Juan Leon Mera established in 1874. 10 (bottom). *Parajubaea cocoides* in front of the cathedral of Cuenca.

11. Coconuts in the central square of San Pedro de la Bendita, 1683 m elevation.

12 plants more, two on each side of the rectangular planting (Fig. 9). There is an interesting morphological diversity in this planting. Some specimens have an erect habit, the larger ones show the characteristic shrinking of the upper part of the trunk and there is a great variation in seed shape.

Parajubaea cocoides in Cuenca

As seen in the previous sections of this article, *Parajubaea cocoides* is quite commonly cultivated in the Ecuadorean Andes and it is therefore somewhat arbitrary to associate it specifically with Cuenca. However, the view of the Cathedral with *Parajuabea* around (Fig. 10) is really emblematic and can be seen in all tourist advertisements for the city. *Parajubaea* similarly enhances the architectural beauty of many historical buildings of the colonial center.

Cocos nucifera in Catamayo and Vilcabamba valleys

Discussing the importance of the coconut in the Andes may seem silly at first. The fact is that Catamayo valley (1150–1280 m), in the southern Andes of Ecuador, is a significant area of coconut cultivation, while Vilcabamba valley (1500–1600 m) is a leisure area where the tropical look of the coconut is appreciated. Coconut plantations are usually located below 500 m elevation, although isolated plants in private yards can be seen fruiting in Ecuador up to 1200 m elevation throughout the Andes. The Catamayo valley is a depression undergoing a dry climate due to a rain-shadow effect, forming a vast, relatively flat plain at the bottom, and totally surrounded by high mountains. This unusual setting is responsible for the existence of a hot and dry climate above 1200 m elevation, often very windy in late afternoon allowing the cultivation of tropical crops by mean of a network of small irrigation channels filled with the water coming from the surrounding mountains. The agricultural activity in the valley is focused on the industrial production of sugar cane, but there is a great diversity of minor crops as well, including plantain, cassava, maize, coffee, pineapple, rice, passion fruit, citrus and various legumes. There is also an interesting selection of ornamental palms, both tropical and subtropical in the area (Table 1). The coconut is cultivated throughout the valley, but at a limited scale. Typically, no more than 1–20 trees are planted around the houses and *fincas*, or along irrigation channels. Most of the production is absorbed by the local market, and what remains is used for domestic consumption. Farmers in Catamayo

Table 1. Ornamental palms cultivated in Catamayo (1280 m elevation).

Tropical species	Subtropical species
Adonidia merrillii	*Phoenix canariensis*
Cocos nucifera	*Phoenix cf. canariensis* × *dactylifera*
Dypsis lutescens	*Syagrus romanzoffiana*
Elaeis guineensis	*Washingtonia robusta*
Livistona rotundifolia	
Phoenix roebelenii	
Pritchardia pacifica	
Ptychosperma elegans	
Roystonea oleracea	

12. The highest fruiting coconuts in Catamayo valley, struggling at 1702 m elevation.

distinguish two classes of coconuts, the *coco*, which produces large fruits of which the solid endosperm is used in culinary preparations (*cocadas*), and the *pipa*, which produces small fruits of which the liquid is used as beverage. Farmers said they cultivate two varieties of *coco* and five of *pipa*. The fruits are sold 10c each and retailers get two glasses of coconut drink that they sell at 25c each, from one *pipa* fruit, meaning a benefit of 40c per fruit. Apart from

Table 2. Data on the altitudinal limit of ornamental coconut cultivation in the southern Andes of Ecuador (1500-1800 m elevation).

Location	Geographic coordinates	Elevation	Observations
Loja-Catamayo road *Estación El Peaje*	03°58′52.0″S 79°19′53.9″W	1526 m	Healthy immature specimen.
Trapiche *Casa El Prado*	04°12′56.0″S 79°13′42.7″W	1565 m	Ornamental fence (ca. 15), mature, fruiting irregular.
Vilcabamba *Parque central*	04°15′39.0″S 79°13′22.4″W	1574 m	One subadult, sterile, weak growth under shade.
Loja-Vilcabamba road *Private garden*	04°10′23.2″S 79°12′53.3″W	1675 m	Mature specimens; no fruits.
San Pedro de la Bendita *Parque central*	03°56′36.0″S 79°26′05.2″W	1683 m	Two mature specimens; fruiting irregular
San Pedro de la Bendita *Private garden*	03′56′43.9″S 79°26′02.5″W	1702 m	Ca. 12 specimens in a row; fruiting irregular.
Sanctuary San Vicente *Private garden*	03°56′55.4″S 79°26′50.7″W	1768 m	Immature; growth abnormal.

the agricultural aspect of coconut production in the bottom of the valley, people in the area are keen on pushing the palm to its extreme altitudinal limit as a challenging weekend gardening activity. Most noteworthy are the two tall coconuts of the central square of San Pedro de la Bendita, at 1683 m elevation (Fig. 11), a row of mature specimens in a private garden nearby at 1702 m (Fig. 12) and a poor but maybe record-holding plant near the sanctuary of San Vicente at 1768 m elevation. Coconut growers at these elevations maintain their plants with a permanent supply of NPK and sodium chloride. With this care, the coconuts do set fruits, but somewhat irregularly, up to 1700 m elevation. In Vilcabamba valley, the highest mature coconuts seen were at 1675 m elevation and were sterile at the time of visit. Individual data about the highest coconuts of the area are given in Table 2.

Acknowledgments

We are grateful to Carlos Uribe, for opening the doors of Hacienda Gualilagua de Lasso in Machachi for us and providing us valuable information, to Zhofre Aguirre (UNL) for information on coconut cultivation in Vilcabamba and to the farmers of the Catamayo valley for their help.

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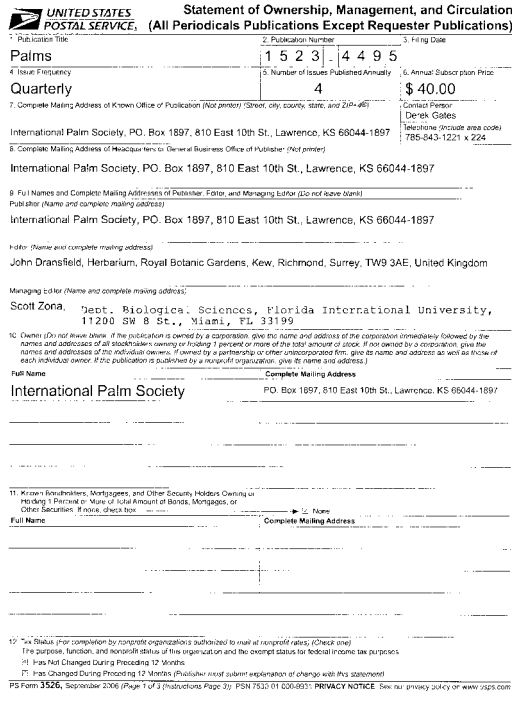

UNITED STATES POSTAL SERVICE, Statement of Ownership, Management, and Circulation (All Periodicals Publications Except Requester Publications)

1. Publication Title: Palms
2. Publication Number: 1523-4495
3. Filing Date:
4. Issue Frequency: Quarterly
5. Number of Issues Published Annually: 4
6. Annual Subscription Price: $ 40.00
7. Complete Mailing Address of Known Office of Publication (Not printer) (Street, city, county, state, and ZIP+4®): International Palm Society, PO. Box 1897, 810 East 10th St., Lawrence, KS 66044-1897
Contact Person: Derek Gates
Telephone (Include area code): 785-843-1221 x 224
8. Complete Mailing Address of Headquarters or General Business Office of Publisher (Not printer): International Palm Society, PO. Box 1897, 810 East 10th St., Lawrence, KS 66044-1897
9. Full Names and Complete Mailing Addresses of Publisher, Editor, and Managing Editor (Do not leave blank)
Publisher (Name and complete mailing address): International Palm Society, PO. Box 1897, 810 East 10th St., Lawrence, KS 66044-1897
Editor (Name and complete mailing address): John Dransfield, Herbarium, Royal Botanic Gardens, Kew, Richmond, Surrey, TW9 3AE, United Kingdom
Managing Editor (Name and complete mailing address): Scott Zona, Dept. Biological Sciences, Florida International University, 11200 SW 8 St., Miami, FL 33199
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Full Name: International Palm Society
Complete Mailing Address: PO. Box 1897, 810 East 10th St., Lawrence, KS 66044-1897
11. Known Bondholders, Mortgagees, and Other Security Holders Owning or Holding 1 Percent or More of Total Amount of Bonds, Mortgages, or Other Securities. If none, check box → ☑ None
Full Name / Complete Mailing Address
12. Tax Status (For completion by nonprofit organizations authorized to mail at nonprofit rates) (Check one)
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☑ Has Not Changed During Preceding 12 Months
☐ Has Changed During Preceding 12 Months (Publisher must submit explanation of change with this statement)
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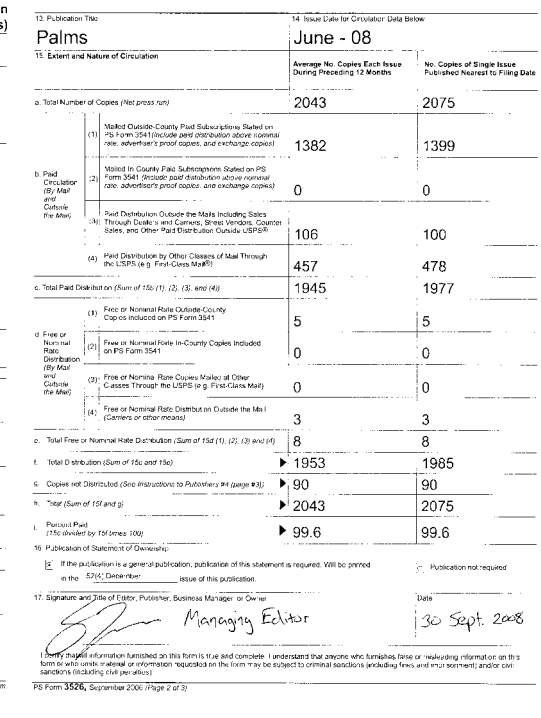

13. Publication Title: Palms
14. Issue Date for Circulation Data Below: June - 08

15. Extent and Nature of Circulation		Average No. Copies Each Issue During Preceding 12 Months	No. Copies of Single Issue Published Nearest to Filing Date
a. Total Number of Copies (Net press run)		2043	2075
b. Paid Circulation (By Mail and Outside the Mail)	(1) Mailed Outside-County Paid Subscriptions Stated on PS Form 3541 (Include paid distribution above nominal rate, advertiser's proof copies, and exchange copies)	1382	1399
	(2) Mailed In-County Paid Subscriptions Stated on PS Form 3541 (Include paid distribution above nominal rate, advertiser's proof copies, and exchange copies)	0	0
	(3) Paid Distribution Outside the Mails Including Sales Through Dealers and Carriers, Street Vendors, Counter Sales, and Other Paid Distribution Outside USPS®	106	100
	(4) Paid Distribution by Other Classes of Mail Through the USPS (e.g. First-Class Mail®)	457	478
c. Total Paid Distribution (Sum of 15b (1), (2), (3), and (4))		1945	1977
d. Free or Nominal Rate Distribution (By Mail and Outside the Mail)	(1) Free or Nominal Rate Outside-County Copies included on PS Form 3541	5	5
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	(3) Free or Nominal Rate Copies Mailed at Other Classes Through the USPS (e.g. First-Class Mail)	0	0
	(4) Free or Nominal Rate Distribution Outside the Mail (Carriers or other means)	3	3
e. Total Free or Nominal Rate Distribution (Sum of 15d (1), (2), (3) and (4))		8	8
f. Total Distribution (Sum of 15c and 15e)		▶ 1953	1985
g. Copies not Distributed (See Instructions to Publishers #4 (page #3))		▶ 90	90
h. Total (Sum of 15f and g)		▶ 2043	2075
i. Percent Paid (15c divided by 15f times 100)		▶ 99.6	99.6

16. Publication of Statement of Ownership
If the publication is a general publication, publication of this statement is required. Will be printed in the 52(4) December issue of this publication. ☐ Publication not required
17. Signature and Title of Editor, Publisher, Business Manager, or Owner: Managing Editor — Date: 30 Sept. 2008
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