

Edible Palms of Southern Ecuador



1. *Aiphanes grandis* in Cerro Azul, El Oro, a palm endemic to Ecuador.

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In southern Ecuador 26 edible palm species were recorded during a study of wild edible plants. These grow mainly in humid coastal and Amazonian lowlands. Most palms have edible palm hearts or edible fruits. The indigenous Shuar people, especially, know and use many palm species.

From 1994 onward, we have carried out research into the wild edible plants of southern Ecuador. The first step was to make an inventory of all wild edible plants in the area, for the Centro Andino de Tecnología Rural (CATER) of the National University of Loja in Ecuador. Research then continued with studying the cultivation potential of certain species and the traditional management of wild plants by local farmers.

The study area of about 30,000 km² is formed by the southern provinces of El Oro, Loja and Zamora-Chinchipe (3°30' to 5°00' S, 78°20' to 80°30' W). Altitude ranges from 0 to 3800 m. The relief is dominated by the Andes, which divide the region into three major geographical areas: coast, Andes and Amazonian area. In southern Ecuador, the branching out of the Andean mountain ranges in all directions creates a very irregular relief. Together with various climatic influences, this results in a large diversity of ecological zones within a relatively small area. For example, within one hour's drive by car from the Andean town of Loja (where we lived), you can be in a hot semi-arid valley (Catamayo), in a dry temperate valley (Vilcabamba), in cold humid mountains (San Lucas) or in a humid tropical environment (Zamora). One important consequence of this diverse ecology is an enormous plant richness. An estimated 6200 species of higher plants grow in southern Ecuador (Jørgensen & León-Yáñez 1999). The population in the region is 95% mestizo, with small communities of indigenous Saraguros in the Andes and Shuar in the lowland Amazonian region.

Palms always stood out in our research, first of all quite literally, because they are so clearly visible in the landscape. In the largely agricultural coastal and Andean landscape, palms are often tolerated in pastures or home-gardens, and are some of the few trees left in the landscape. Even in patchy forest remnants and in the extensive Amazonian forests, palm trees usually tower above other tree species. A second reason they always stood out is that they would not fit into our plant press. Used to collecting 'ordinary' plant specimens, we were at first puzzled as to how to fit a palm leaf or inflorescence onto a standard herbarium sheet. Simply being able to reach the leaves seemed impossible, especially for those palms covered in vicious spines. The first collected palm samples, where we brought back small leaf parts and fallen fruits, caused hilarious laughter from Henrik Pedersen, the Danish palm specialist then working at Loja herbarium, when we asked him to identify these palms. He showed us how to collect palm specimens properly, folding massive leaves and inflorescences back to 30 × 40 cm samples and

then encouraged us to collect any interesting palm we would come across, as they were so under-collected compared to other plant families (because they are indeed so awkward to collect). This way we got to eat a lot of delicious fresh palm heart.

Henrik's advice meant that the Loja herbarium gained 40 complete palm specimens (and the extra cupboards we had to buy to fit them all in). Another small hiccup was the fact that cardboard boxes to store them in were impossible to get hold of in Ecuador, so we resorted to making our own to size from sheets of cardboard. Many an hour was spent cutting and folding boxes, so the palms remained exceptional until the end.

The idea to write this article was suggested by Dennis Johnson, who informed us that we had recorded for the first time that juvenile inflorescences of *Dictyocaryum lamarckianum* are eaten. Rather than write about that species alone, we decided to include in this article all the information we collected on palms in southern Ecuador.

Where palms grow in southern Ecuador

Of the 354 species of wild edible plants we recorded in southern Ecuador (Van den Eynden et al. 1999; Van den Eynden et al. 2003; Van den Eynden 2004), 26 are palms. They are the second most represented plant family. The majority of palms grow in the coastal and Amazonian humid lowlands and up to 2000 m altitude. Eleven species were found in the coastal area and eighteen in the Amazonian region. Five species grow on both sides of the Andes. Only three species are found in the Andes above 2000 m. Five species – *Aiphanes grandis*, *A. verrucosa*, *Astrocaryum urostachys*, *Ceroxylon echinulatum* and *Phytelephas aequatorialis* – are endemic to Ecuador (Jørgensen & León-Yáñez 1999).

Palm trees are fairly abundant in relatively intact forests, like those found on the eastern Andes slopes and in the Amazonian region, where few people live. In the Andes and the coastal areas, few forests remain today. Palm trees may be found here in small forest remnants or as managed trees in the agricultural landscape. Many edible plants in southern Ecuador are indeed not strictly wild, but are managed by farmers within the agricultural area (Van den Eynden 2004). Plants may be sown or planted, wild plants may be transplanted and spontaneously grown plants may be tolerated. Such managed plants are found in all parts of the agricultural area, but mostly in gardens, pastures and hedges.

Palm trees are still relatively abundant in pastures in recently colonized areas in the humid coastal



2. *Ceroxylon echinulatum* palms tolerated in a maize field in Chalanga, Loja.

lowlands (Casacay, Cerro Azul) and on the Amazonian slopes (Quebrada Honda, Tutupali). In other areas that have been farmed for centuries, palms are a lot rarer. Some individual trees may be found planted in gardens and villages. In the Amazonian region, where palms are relatively abundant, Shuar people also plant and manage species such as *Bactris gasipaes*, *Mauritia flexuosa*

and *Astrocaryum urostachys* in their gardens and in the forest.

How palms are used

Most palm trees in southern Ecuador have edible palm heart (21 species) or edible fruits (11 species). It is usually the fruit mesocarp, sometimes the endosperm or seed that is edible. Of one species,



3. The edible juvenile inflorescence of *Dictyocaryum lamarckianum*.

Dictyocaryum lamarckianum, the immature inflorescence is eaten. In the Andean region, palm heart is an important ingredient of the traditional dish *fanesca*, which is prepared on Good Friday. *Fanesca* is a stew made of various grains, beans, pulses, root vegetables, pumpkins, dried fish and rice, garnished with shredded palm hearts, hardboiled eggs, cheese, fish and chili peppers. The heart of any palm species can be used, but *Prestoea acuminata* is the most common in the Andes. This is often the only time of year people in Andean communities harvest palm heart, mainly because there are so few trees left.

Palms in the coastal region and western Andean foothills

In the humid coastal lowland area in the north of El Oro province, an area with evergreen lowland and premontane vegetation (Casacay, Cerro Azul), we find many palm species tolerated in pastures. *Iriartea deltoidea* is a solitary palm, locally known as *pambil*, that grows from 400 to 1900 m above sea level. Its palm heart is eaten raw or cooked. The juvenile fruits can be eaten too. *Bactris setulosa*, named *chontilla*, is found at altitudes from 100 to 1400 m. This multi-stemmed palm with black spines has an edible palm heart. Its wood is used for making fencing posts. *Bactris macana* (*chonta*), another multi-stemmed spiny palm grows in

humid areas, but also in slightly drier regions (Orianga), at altitudes from 600 to 1300 m. The red spherical fruits (2 cm diameter) are cooked or roasted and the pulp (mesocarp) is eaten. The palm heart is eaten raw or cooked. The wood is used for joists and rafters in house construction and for fences. Other species with edible palm hearts are *Euterpe precatoria* (*palmo real*), a solitary palm growing between 900 and 1300 m above sea level, *Prestoea ensiformis* (*caño*), a solitary palm with red stilt roots found between 500 and 1200 m above sea level, and *Wettinia kalbreyeri* (*pambil*), a solitary palm with thick stilt roots, found between 700 and 1200 m. The wood of this last palm is used for house construction and fences.

The endemic palm *Phytelephas aequatorialis* (*tagua*), is found up to 1500 m above sea level. The palm heart is edible. The liquid inside juvenile fruits can be drunk and is considered to be good for the kidneys. Mature seeds are used for carving as vegetable ivory. The leaves can be used for thatching and brooms are made from the fibers of the leaf bases. *Attalea colenda* (*chivila*) has seeds from which oil can be extracted. Although locally the plant is not used for this purpose, the orange oval fruits about 6 cm long are fed to pigs. This palm normally grows between 400 and 500 m, but was found introduced in gardens in Orianga at 1300 m altitude.

At higher altitudes, in areas with humid montane vegetation, we find *Aiphanes grandis* (*chonta*) (Fig. 1) between 1100 and 1700 m above sea level. This palm with very long black spines is endemic to Ecuador. The palm heart is eaten raw or cooked. The seeds can be made into a nougat – the fruits are boiled in water and the seeds then pureed and cooked with crude cane sugar until the mixture thickens. *Ceroxylon echinulatum* (*palma*) (Fig. 2) is a solitary palm with red spherical fruits (2 cm

diameter) with edible seeds, which are roasted or cooked before eating. This endemic Amazonian palm was found in humid forest and tolerated in maize fields in Loja province at around 1300 m elevation.

Palms in the Andean region

Prestoea acuminata is the palm most widely found in southern Ecuador. It grows at elevations between 800 and 2600 m on both sides of the

4. *Dictyocaryum lamarckianum* inflorescence being harvested in Tutupali, Zamora-Chinchipe.



Andes range. It has various common names that differ from place to place: *palmito*, *caño*, *tinguiso* or *sake*. This multi-stemmed palm with spiny stilt roots has an edible palm heart that can be eaten raw, fried or cooked. *Aiphanes verrucosa* (*chonta*) is endemic to southeastern Ecuador, where it grows between 1800 and 2800 m above sea level. This multi-stemmed palm has clustered black spines and large inflorescences with greenish-white spherical fruits (2–3 cm diameter). The fruits are eaten raw or poached. The leaves are used for thatching. *Ceroxylon vogelianum* (*coco*), a solitary palm with grey trunk is found between 2000 and 3000 m. The small green fruits (1.5 cm diameter) are edible and the leaves are used for thatching.

Palms in the Amazonian region

Many palm trees are used by indigenous Shuar people, who live in the easternmost part of Zamora-Chinchiipe province, along the Río Zamora, Río Nangaritza, Río Numpatakaima and their tributaries, at around 900 m altitude. Palms play an essential role in their subsistence. Palm heart and fruits are regularly eaten. *Bactris gasipaes* (*chonta* in Spanish, *uwí* in Shuar language) especially is very important in Shuar culture. The orange fruits (up to 5 cm diameter) are an important food. Each year in April, the *fiesta de la chonta* takes place (Anon. 1977; Borgtoft et al. 1998), celebrating nature's life cycle. *Chicha* made of *uwí* fruits is drunk during these celebrations. The fruits are also eaten after boiling or roasting them, or can be cooked in milk and then pureed into a stew. The palm heart is edible too. *Bactris gasipaes* is often cultivated or managed near the houses.

Palms with edible palm heart eaten by the Shuar are *Astrocaryum urostachys* (*awant'*), *Ceroxylon amazonicum* (*paik'*), *Iriarte deltoidea* (*ampakai*), *Mauritia flexuosa* (*achu*), *Oenocarpus bataua* (*kunkuk'*), *Oenocarpus mapora* (*shímpi*), *Prestoea acuminata* (*sake*), *Prestoea schultzeana* (*tinkimi*), *Socratea exorrhiza* (*kupat*) and *Wettinia maynensis* (*terén*). *Oenocarpus bataua* is considered to have the tastiest palm heart. Palm heart is eaten raw or prepared in *tonga*. *Tonga* are made by wrapping a mixture of fish, meat, vegetables and condiments in large banana, *Canna edulis* or *Renalmia alpinia* leaves. The *tonga* are then roasted in an open fire.

The seeds of the endemic palm *Astrocaryum urostachys* and juvenile fruits of *Iriarte deltoidea* are eaten raw. The fruits of *Mauritia flexuosa*, *Oenocarpus bataua* and *Oenocarpus mapora* are softened in hot water and then eaten. The first species has large oval fruits (7 × 4 cm) covered with red-brown scales. The two *Oenocarpus* species have oval purple fruits of about 3 to 4 cm long.

Palm trees are also used for other purposes. The wood of *Bactris gasipaes*, *Iriarte deltoidea*, *Oenocarpus mapora* and *Socratea exorrhiza* is used for making walls and roof structures of houses. The leaves of *Oenocarpus mapora*, *Prestoea schultzeana* and *Wettinia maynensis* are used for thatching roofs. The rachides (leaf stalks) of *Oenocarpus bataua* and *Oenocarpus mapora* are used for making *huashimas* and in the past for making arrows. *Huashimas* are a type of fish trap made by tying 2–3 m long palm leaf rachides together to a width of about 60 cm. Fish stupefied by throwing fish poison into the river are caught downstream by *huashimas* that have been placed vertically in the water.

The rest of the Amazonian region is inhabited by mestizo colonizers, who also frequently use palm trees. *Bactris setulosa* (*chonta*) grows up to 1400 m altitude. The red fruits (2 cm diameter) are cooked or roasted and the pulp eaten. *Dictyocaryum lamarckianum* (*palma*) (Figs. 3 & 4) grows between 1000 and 1800 m. The juvenile inflorescence of this palm is eaten raw. It is harvested when still surrounded by the bract. This is apparently the first time this use is recorded for this species (Dennis Johnson, pers. comm). *Euterpe precatoria* (*shimbe*), growing between 900 and 1900 m, *Pholidostachys synanthera* (*palma paja cambana*), growing between 900 and 1400 m, and *Wettinia* cf. *maynensis* (*palma*) found at around 1000 m, all have edible palm hearts.

Conclusions

Palm trees are known throughout the neotropics to be useful species. This is confirmed in our study in southern Ecuador, where the palm family is the second most represented family with edible species. Twenty-six edible palms were recorded. They are not only eaten but also used for other purposes throughout the humid areas of southern Ecuador.

The indigenous Shuar people, especially, use and know many different palm species. Palm heart and fruits of twelve palm species form an important part of their diet. Trees are typically cut down to harvest the fruits or palm heart. The cultural importance of palms to Shuar people is also reflected in the names given to them. Shuar people give each palm tree a unique name, whereas mestizo people use more general and vague names like *palma* (palm tree) or *chonta* (spiny palm) for many different palms (Van den Eynden 2004).

The fact that a new palm use was recorded from mestizo colonizers in the Amazonian region (the eating of *Dictyocaryum lamarckianum* inflor-

escences) shows that non-indigenous people also have important and often unrecorded plant knowledge.

Palm trees are commonly found in the forests of the Amazonian region or as tolerated trees in pastures and near houses. In coastal lowlands, palms are still commonly found in areas that have recently been colonized, where they are often left to grow in pastures. In other areas, they are very scarce. This is probably due to a combination of forest clearance and use of the palms, which usually requires them to be cut down. Although palm heart is considered to be a delicacy in the Andean region, and an essential ingredient of the traditional dish *fanesca*, it is not often used nowadays, due to its scarcity.

Distribution ranges given here are for southern Ecuador only and are based on field research and on Borchsenius et al. (1998). Detailed descriptions of each species and its use and distribution, as well as lists of all collected specimens, can be found in Van den Eynden et al. (1999) and Van den Eynden et al. (2003). All collected specimens are held in the LOJA herbarium, with duplicates in the QCA and QCNE herbaria in Quito. No doubt other palms grow and are used in southern Ecuador, but we recorded only edible palms during our research.

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LITERATURE CITED

- ANON. 1977. Las Plantas. Mundo Shuar, Serie A, Fascículo 5. Sucua, Ediciones Mundo Shuar, Centro de Documentación, Investigación y Publicaciones.
- BORCHSENIUS, F., H.B. PEDERSEN & H. BALSLEV. 1998. Manual to the Palms of Ecuador. AAU Reports 37. Dept. of Systematic Botany, Aarhus University, Aarhus.
- BORTGTOFT, H., F. SKOV, J. FJELDSÅ, I. SCHJELLERUP & B. ØLLGAARD. (eds.). 1998. People and Biodiversity – Two case studies from the Andean Foothills of Ecuador. Centre for Research on Cultural and Biological Diversity of Andean Rainforests, DIVA, Technical Report 3.
- JØRGENSEN, P.M., & S. LÉON-YÁNEZ. (eds) 1999. Catalogue of the Vascular Plants of Ecuador. Missouri Botanical Garden Press, St. Louis.
- VAN DEN EYNDEN, V., E. CUEVA & O. CABRERA. 1999. Plantas silvestres comestibles del sur del Ecuador – Wild edible plants of southern Ecuador. Ediciones Abya-Yala, Quito.
- VAN DEN EYNDEN, V., E. CUEVA & O. CABRERA. 2003. Wild foods from southern Ecuador. *Economic Botany* 57: 576–603.
- VAN DEN EYNDEN, V. 2004. Use and management of edible non-crop plants in southern Ecuador. PhD dissertation. University of Gent, Gent.