

NOTES ON SOUTH AMERICAN CEDAR (*CEDRELA FISSILIS*)
IN THE SACRED ART OF BRAZIL

by

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Summary

The use of cedar (most probably *Cedrela fissilis* Vell.) in Brazilian sacred art is discussed. A wood anatomical description and an account of wood properties that make this now almost depleted tropical hardwood so suitable for wood carving, are given.

Key words: *Cedrela fissilis*, *Cedrela odorata*, wood carving, wood anatomy, século do ouro.

Introduction

The literature about the utilisation of woods as raw materials rarely refers to their use for artistic purposes. No dendrological information exists, for example, on the wood carvings that adorn Brazilian churches, especially those built during the period known as the 'século do ouro' (golden century) that had its climax in the state of Minas Gerais between the seventeenth and eighteenth centuries. The now-exhausted resources of the gold, silver and gem mines left cities like Ouro Preto, Tiradentes, Sabará, São João del Rey, Mariana, and other colonial cities as authentic museums of the Baroque period in Brazil.

This note covers a dendrological study of South American cedar (*Cedrela fissilis* Vell.), which was extensively used during the golden century in the manufacture of religious sculptures throughout Brazil.

The sculptures from which samples were taken for wood identification are all from the eighteenth century. Nevertheless, all of them are from the same period as the golden century. The carved wooden images from which small wood samples were received are the eight sculptures shown in Figures 1 to 8. All the samples are considered to belong to *Cedrela fissilis* Vell. The specimens studied are listed below.

Cedrela fissilis Vell.: Brazil, Minas Gerais state, Sabará (city), Igreja da Ordem Terceira do Carmo: São Simão Stock image (MGx 7197), São João da Cruz image (MGx 7195). Museu do Ouro de Sabará: São Francisco de Paula image (MGx 7199), Santa Teresa D'Ávila image (MGx 7196). Santa Luzia (city), Igreja Matriz de Santa Luzia: Santa Luzia image (MGx 7201), São Miguel Arcanjo image (MGx 7200), São João Nepomuceno image (MGx 7198), São Bras image (MGx 7202).

General information on South American cedar

The designation 'cedar' covers all eight species of *Cedrela* (Meliaceae) concentrated in the tropics of the New World. Cedar has a wide distribution all over tropical America, where it is part of a main group of woods known as 'noble' for their remarkable qualities.

In Brazil cedar is regarded as being in danger of extinction due to the severe exploitation it has suffered since colonial times. It has highly diversified utilisations, with many applications in building construction in the making of wooden beams, sashes, window blinds, door frames, baseboards, moldings, ceilings, panels, staircases, and partition walls. It is employed in turned pieces as ornamentation, and in wood carvings, furniture, wooden cutlery handles, knobs, curved pieces like tennis rackets, etc. It is used in shipping crates and light package boxes. In naval architecture it is used for deck planks of ships and in small boats. It is preferred for some musical instruments and has several other special applications as doors, broomsticks, etc. (Mainieri & Chimelo 1989).

Two species of cedar are more frequent in Brazilian forests than the others of the genus: *Cedrela fissilis* and *Cedrela odorata*. *Cedrela fissilis* occurs from sea level to 800 metres. It is widely distributed in Latin America, from Costa Rica and Panama in Central America to the north of Argentina, with greater frequency in coastal areas. In Brazil, *C. fissilis* appears in all regions throughout the country. In the state of Minas Gerais, this cedar is well documented from collections made in Curvelo, Lagoa Santa, Ituiutaba, Sete Lagoas, Viçosa, Caldas, etc.

Another species with an equally wide distribution is *Cedrela odorata* that is found along the Pacific coast of Mexico, from the state of Sinaloa (lat. 26° N), reaching Central America, the Caribbean Islands, and South America as far as northeastern Argentina. In Brazil, *C. odorata* shows a more limited distribution than *C. fissilis*, appearing in the Amazon Basin and spreading to the states of Goiás, Mato Grosso and Maranhão, extending into northeastern Bahia, Espírito Santo and Rio de Janeiro (Styles 1981).

Geographic distribution of both species shows that *C. fissilis* is more common in the countryside forests of Minas Gerais, spreading as far as the state of Rio Grande do Sul. This fact supports the conclusion that the wood used in the making of religious sculptures during the golden century in Minas Gerais was obtained from *C. fissilis*, which was closest to the towns where the craftsmen worked. The Amazon region of Brazil, on the other hand, has been an isolated region until the present day, which leads one to conclude that the cutting and transportation of *C. odorata*, from the Amazon to Minas Gerais, would not have been probable, especially since local forests held an abundance of *C. fissilis* cedar with the same general properties as the other cedar species. Unfortunately, it is not possible to determine the exact wood species through anatomical study because the cedar species in general are very homogeneous with regard to their structural organisation. Since the samples from Baroque sculptures of the churches of Minas Gerais date from past centuries, one cannot be fully certain which of the cedar species one is dealing

with. However, this fact has relatively little importance since all species of cedar have similar properties so that all of them are used in the same way.

Botanical features and wood anatomy of *Cedrela fissilis*

Botanical features — The mature trees are tall, most individuals reaching 30 metres but some reaching 40 metres; generally without branches until several metres high up the trunk; 1 metre or more in diameter above the buttress roots (large tabular prop roots that grow out from the trunk) with thick, red-greyish, rugged, cracked bark.

Anatomical description (Figs. 9, 10) — Growth rings marked by both marginal parenchyma and often also by differences in pore diameter between late- and earlywood. Wood diffuse to semi-ring-porous. Vessels circular to subcircular in transverse section, thin-walled; tangential diameter 80–310 µm (average 200 µm), mostly 150–200 µm; very few to numerous, 1–8 (average 3) per mm²; predominantly solitary (70%), remainder in pairs; perforations simple; intervessel pits polygonal and alternate, 5–10 µm in diameter; vessel elements 150–650 µm (average 522 µm, most frequent range 400–650 µm) long; vessel contents absent or present as oil resin or unidentified white substance. Rays biseriate (77%), triseriate (17%) or more rarely uniseriate (6%), 80–170 µm or 9–22 (average 12) cells tall; 7–13 (average 9) per line near mm. Fibres exclusively libriform; double wall thickness on average 9 µm, thinner than lumen diameter; 1120–2100 (average 1540) µm long. Traumatic secretory canals normally present. Axial parenchyma usually in tangential bands, often forming concentric lines or 1–6 cells wide bands; diffuse parenchyma scarce.

Wood features — The heartwood varies from light brown to pinkish beige to reddish brown, rather different from the pale pink sapwood. Sapwood with medium to high shine and golden reflex; rough texture, spicy scent, slightly bitter taste (Loureiro & Silva 1968). As mentioned previously, cedar is preferred for a number of different applications. Religi-

ous wood carvers and sculptors prefer cedar because it is appropriate for hand carving due to its physical qualities. Many hand-carved works made of cedar can be found in churches throughout the Americas where the species occurs. Excellent examples are the panels of the ancient Comayagua Cathedral in Honduras, the São Francisco de Assis church in Ouro Preto, Minas Gerais, and many others throughout Brazil. It is a light-weight wood ($0.44\text{--}0.60\text{ g/cm}^3$), strong in proportion to its weight, extremely durable, showing a good resistance against decomposition, termites and other insects because it is resinous. The tensile strength and cleavage are low. It takes on a good finish. This wood is easily

worked by hand with hand-tools because its fibres are slender and thin-walled.

References

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