

Short Communication

Ocotea quixos, American cinnamon

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Summary

Among the three South American Lauraceae with cinnamon odours, *Ocotea quixos* Lam. is distinguished with the richest historical legacy. Cinnamaldehyde, its odoriferous principle, occurs besides *o*-methoxycinnamaldehyde, cinnamic acid and methyl cinnamate in the fruit calyx. In contradistinction, 1-nitro-2-phenylethane is responsible for the cinnamon odour of bark and leaves of *Aniba canelilla* (H.B.K.) Mez and *Ocotea pretiosa* (Nees) Mez.

History and botany

Cinnamon country (*país de la canela*) was the name conferred by Francisco Pizarro to the east Andean slopes covered by a dense tropical jungle (Zárate, 1947; Fernandez de Oviedo, 1959). The desire to exploit its riches (Velasco, 1977 - 1979) motivated the establishment of a settlement, Canelos, on an affluent of the river Napo and the epic voyage of 1540, during which Francisco Orellana reported having fought woman warriors (hence the name given to the river Amazonas), and which took him and his soldiers to the Atlantic coast and thence back to their Spanish homeland.

American cinnamon (*canela americana*) (Cobo, 1891; Fernandez de Oviedo, 1959), the tree which produces *ishpingo* (or *espingo*), the odorous fruit calyx presented by the Incaic emperor Atahualpa to Pizarro (Gonzalez Suarez, 1969), grows spontaneously, and is now also cultivated in the humid, subtropical and tropical valleys, called *provincias de la canella*, of oriental

Ecuador. The epithets of its scientific names *Ocotea quixos* Lam. (Paredes, 1967), syn. *Nectandra cinnamomoides* Nees (Sodirol, 1850), refer respectively to Quijos, the valley situated closest to Quito, and to the odour of the species. The trivial designation *espingo* seems to be applied equally to products from several quite unrelated plants, for example *Quararibea* sp. (Bombacaceae) and *Gnaphalium dysodes* Spreng. (Compositae) (Wassén, 1979).

Already at Incaic times, *ishpingo* was reputed as medicine and as spice. Its aromatizing properties, rather than any hallucinogenic effect probably due to other plant material (Naranjo, 1969, 1970), motivated its addition to ritual beverages. Even in contemporary Ecuador it continues to be a highly valued article of trade, still being used not only in traditional medicine as an appetizer, eupeptic, antidiarrheal, disinfectant and local anaesthetic, but also very generally as a spice. As such it is an obligatory ingredient of *alajua* (an alcoholic beverage based on fermented cornflour and added dark brown molasses) and of *mazamorra morada* (a dessert based on dark violet corn). Both preparations are offered in honour of a family's ancestors, undoubtedly a religious syncretism (de Villagomes, 1919; de Arriaga, 1920).

Another historical account on "cinnamon" from South America refers to Alexander von Humbolt's "famous cinnamon of the Orinoco" encountered during his and Aimé Bonpland's 1800 expedition, on and near Mount Canelillo. Carolus Mez (1889), who designated the species *Aniba canelilla* (H.B.K.) Mez, described additionally *Ocotea pretiosa* (Nees) Mez from the vicinity of Rio de Janeiro in the following terms: "Expirat quidem odorem cinnamomi et ab incolis canella nuncupatur, sed quae de plante virtute scripta, omnia fere ad *Anibam canelillam*, adhuc com ea confusam deferendam."

Chemistry

The odoriferous principle of both the pan-Amazonian *Aniba canelilla* (Gottlieb and Magalhães, 1960) and the cinnamon smelling variety of *Ocotea pretiosa* (Gottlieb *et al.*, 1962a), is 1-nitro-2-phenylethane (Gottlieb and Magalhães, 1959) whose decomposition gives hydrocyanic acid (Gottlieb *et al.*, 1962b, 1963). Indeed the bark of *Aniba canelilla* (*casca preciosa*) is reported to be used only occasionally in popular perfumery and in the preparation of a "stimulating tea" (Ducke, 1938).

The three cinnamons, *A. canelilla*, *O. pretiosa* and *O. quixos*, all belong to the Lauraceae family. Is *O. quixos* characterized by the same singular chemical composition of the other two species? The answer to this question is, fortunately for past and future consumers, negative. A chemical analysis of *ishpingo* revealed the presence of cinnamaldehyde, *o*-methoxycinnamaldehyde, cinnamic acid and methyl cinnamate.

With respect to its odorous fraction, "american cinnamon" is thus similar to the traditional spice derived from *Cinnamomum zeylanicum* Blume.

Experimental

Floral calyces of *Ocotea quixos* (identified at the Institute of Natural Sciences, University of Quito) were collected in the Quijos region, Ecuador, dried and powdered. The ethyl acetate extract (50 g) of the powder (900 g) was chromatographed on silica gel (1 kg). Successive elution with mixtures of hexane and benzene (9:1, 8:2, 6:4, 3:7) and of benzene-ethyl acetate (8:2) gave five fractions. The first fraction was composed mainly of aliphatic material (16 g). The second fraction was purified by preparative thin-layer chromatography (TLC) on silica gel (benzene-ethyl acetate, 9:1) to yield *methyl cinnamate* (1.6 g). The third fraction was crystallized from hexane to yield *cinnamaldehyde* (17 g). The fourth fraction was purified by preparative TLC (silica gel, benzene-ethyl acetate 17:3). The product was crystallized from hexane to yield *cinnamaldehyde* (0.5 g). The mother liquor gave *o-methoxycinnamaldehyde* (50 mg). The fifth fraction, washed with hexane and benzene, gave *cinnamic acid* (1 g).

All compounds were identified by melting point and spectra (infrared, ultraviolet, ^1H nuclear magnetic resonance, mass spectrometry). The identifications were confirmed by direct comparison with authentic samples.

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