

121. *DIPTERYX ODORATA* (Aubl.) Willd. (FABACEAE) — Tonka Bean, Tonga, Cumaru

Tonka beans are cultivated for the seed which yield coumarin, used to give a pleasant fragrance to tobacco, a delicate scent to toilet soaps, and a piquant taste to liqueurs. The extract is also used in foodstuffs, e.g., cakes, candies, preserves, and as a vanilla substitute, as a fixing agent in manufacturing coloring materials, in snuffs, deodorants, and in perfume industry. The most important use of coumarin in the U.S. is for flavoring tobacco.<sup>40</sup> The timber is said to resist the marine borer, perhaps, because it contains 0.01% SiO<sub>2</sub>. Williams describes the "maypole" festivities of the Black Caribs of Nicaragua, celebrated when the Central American species *D. oleifera* is ripe. The Caribs make a paste of the seeds, mix it with coconut water or milk, and make a rich nut-flavored beverage, more satisfying than a malted milk.<sup>22</sup>

Said to be used for cachexia, cramps, fumigation, narcotic, nausea, spasms, whooping cough, tonic. Fluid extract has been recommended in whooping cough, regarded as a spasmolytic. Seed extracts are used rectally for schistosomiasis in China.<sup>40</sup> Guyanese use the astringent gum for sore throat. Brazilians apply the seed oil for buccal ulcers and earache. Black Caribs are said to use the fruits as an aphrodisiac.<sup>22</sup>

The active constituent of the seed may be coumarin. "Dietary feeding of coumarin to rats and dogs causes extensive liver damage, growth retardation, and testicular atrophy."<sup>62</sup> Coumarin may constitute 1 to 3% (rarely 10%) of the seed. Five isoflavones have been isolated from the heartwood: retusin, retusin 8-methyl ether, 3'-hydroxyretusin 8-methyl ether, odoratin, and dipteryxin. A sample of Malaysian tonka bean oil showed 6.1% palmitic-, 5.7% stearic-, 59.6% oleic-, 15.4% linoleic-, and 13.2% C26 to C24 acids. Sitosterol and stigmasterol are also reported.<sup>33</sup> Nineteen samples of beans from Venezuela and Trinidad (uncured) contained concentrations of coumarin ranging from 2.1 to 3.5% of the dry weight. Moisture content varied from 6.9 to 8.4%. One sample of Brazilian beans contained 10.2% moisture and 2.7% coumarin. Variation is reported: Surinam beans contained 2.4% of coumarin and 29.2 to 33.7% of alcoholic extractive; 2.6% coumarin in Imburana beans, and 1.3% of coumarin and 49.5% of alcohol extractive in Trinidad beans. From the cotyledons *o*-coumaric acid and a beta-glucoside are reported. The resin exuding from the bark contains lupeol, betulin, and a mixture of 75% methyloleate, 3% methylilinolenate, and 10% conjugated methylilinoleate.<sup>33,40</sup> Sullivan<sup>151</sup> reports umbelliferone (7-hydroxycoumarin) in the methylene chloride extract of the seed.

**Toxicity** — Narcotic, the fluid extract can paralyze the heart if infused in large doses.<sup>2</sup> The reddish sawdust once caused a workman's hair, when wetted, to turn bright green.<sup>6</sup>