quote as I was, but note how the omission of three little words made it look as though Duke and Farnsworth were being quoted, not Martin. Perhaps similar quotes may be taken from this book, but neither I, the editors, CRC Press, NCI, or the USDA are endorsing any herbal remedy for cancer. I am merely compiling information on biological activity of some plants and plant-derived compounds. Even though some folk cancer plants do contain biologically active compounds with antitumor compounds, we do not endorse herbal medication. Lapachol was listed recently by Perdue[308] among the most important antitumor agents from plants. There are many folk uses reported in the popular press. Californians tell me in 1983 that they are drinking pao d'arco for fungal infections and applying the decoction (one spoon soaked in a quart of water overnight) locally to *Candida*. They report favorable results. Personally, I would not hesitate to apply such a decoction or drink so dilute a tea. But, if there are data to show long-term effects, positive or negative, I do not know them. Xyloidone, as noted, is active against *Candida*.

According to *Hager's Handbook*,[33] the wood of *T. ipe* contains *circa* 3.7% lapachol ($C_{15}H_{14}O_3$); the essential oil ranges from 0.55 to 1.49% (predominantly sesquiterpenes), resin 3.3 to 4.5%, waxy matter with ceryl alcohol and lignoceric acid 0.95 to 1.18%, lactone bitter substances 0.85 to 1.4%, glycosidol bitter substances 0.025 to 0.042%, 12.2 to 17.8% tannin, yielding protocatechuic acid, and 3 to 4% acids and neutral saponins; wood also contains napthaquinones and anthraquinones. The latter might explain its folk usages for psoriasis. According to Prakash and Singh,[309] the stembark of *T. pentaphylla* contains lapachol, nonacosane, dehydrotectol, and beta-sitosterol, the roots hexacosane, dehydrotectol, beta-sitosterol, and oleanolic acid. Some species contain xyloidone, which is active against *Brucella* and *Candida*. Much of the activity may be traced to the lapachol. Lapachol has shown antimalarial activity in animals.[309] It is known to uncouple oxidative phosphorylation. Lapachol, active against Gram-positive and acid-fast bacteria, as well as fungi, was once of great interest to the NCI. Lapachol was found to have anticancer activity. Filed in 1967, lapachol was dropped from NCI investigations because of therapeutic inactivity. Reported by Hartwell[4] from *Stereospermum suaveolens*, lapachol occurs in several species of *Tabebuia*, e.g., *T. rufescens* and *T. serratifolia*. Old correspondence from Hartwell suggests that lapachol has also been isolated from woods of taigu, greenheart, lapacho, mao, ipedo campo, ipeamarillo, ipe tabaco, mostly species of *Bignonia, Tabebuia*, and *Tecoma*. In my "Phytotoxin Tables",[15] I cited *Avicennia, Bassia, Bignonia, Paratecoma, Tabebuia, Tecoma,* and *Tectona* with questionable citations for *Adenanthera, Andira,* and *Intsia*. Brazilian species of *Tabebuia*, known as pao d'arco and lapacho, have gotten big press sporadically over the last 50 years as cancer remedies. Thus, *Stereospermum* and *Tabebuia*, classical sources of lapachol, both have folk histories as "cancer remedies". I have received unsolicited testimonials from "recovered patients" supposedly cured by pao d'arco. Recently, I submitted an unvouchered sample of ipe roxo ("*Tecoma curialis*") to the NCI for screening. This is also labeled pao d'arco herbal tea. There are no cancer claims on the label, but the pao d'arco has gotten enough press to generate a North American interest in lapachol, dropped by NCI because of "no therapeutic effect." Hartwell[4] notes that lapachol was carried into clinical trial because "of its high Walker 256 activity even when given orally." Lack of toxicity permitted large oral doses but sufficiently high blood levels could not be obtained to show a therapeutic effect. While lapachol was inactive against L1210 leukemia, the sodium salt of lapachol was active.

Toxicity — At high oral doses, lapachol causes nausea, vomiting, and a reversible prolongation of the prothrombin time, the latter effect possibly due to lapachol's structural similarity to vitamin K. Clinical studies were discontinued not only because of anticoagulant effects, but also because therapeutic plasma levels of >30 μg/mℓ of lapachol could not be achieved without encountering toxicity.[310]