

MATERIALS TOWARD A MONOGRAPH OF THE GENUS CITHAREXYLUM. I

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This is the nineteenth in my series of works of monographic nature on the genera of Verbenaceae. Previous genera so treated are Aegiphila Jacq., Amasonia L. f., Baillonia Bocq., Bouchea Cham., Casselia Nees & Mart. [Timotocia Moldenke], Castelia Cav., Chascanum E. Mey., Cornutia Plum., Petitia Jacq., Petrea Houst., Priva Adans., Recordia Moldenke, Rehdera Moldenke, Rhaphithamnus Miers, Svensonia Moldenke, Tectona L. f., Vitex Tourn., and the New World and cultivated members of Callicarpa L.

Full explanation of the abbreviations employed herein for the names of the 249 herbaria whose material was examined in the preparation of this work will be found in Phytologia 5: 154--159 (1955) with the following additions:

- Ad = Universidad de Los Andes, Mérida, Venezuela
- Fy = University of Arkansas, Fayetteville, Arkansas
- Lz = A. Lutz Herbarium, Universidade do Brasil, Rio de Janeiro
- Pe = Museo de Historia Natural, Universidad Nacional Mayor de San Marcos, Lima, Peru
- Sk = University of Saskatchewan, Saskatoon, Saskatchewan
- Yu = T. G. Yuncker Herbarium, Greencastle, Indiana

CITHAREXYLUM B. Juss. ex L., Sp. Pl., ed. 1, 625 (1753), Gen. Pl., ed. 5, 273 [as "Citharexylon"]. 1754.

Synonymy: Citarexylon L., Syst. Nat., ed. 6, ind. p. 2. 1748. Citharexylon L., Syst. Nat., ed. 6, 116. 1748. Citharexylon B. Juss. ex L., Amen. Acad. 1: 406. 1749. Citharexylum Mill., Gard. Dict., ed. 6, App. 1752. Citharoxylon L., Syst. Nat., ed. 11, 2: ind. q.3. 1760. Citharexylon Pluk. ex Adans., Fam. Pl. 2: 200. 1761. Kitarexulon Adans., Fam. Pl. 2: 12. 1763. Citharoxylum Mill. ex Hildt, Beschr. In- und Ausl. Holzart. 45. 1798. Rauwolfia Ruiz & Pav., Fl. Peruv. & Chil. 2: 26, pl. 152. 1799 [not Rauwolfia Plum., 1737 & 1753]. Citharexylon L. ex Steud., Nom. Bot., ed. 1, 202. 1821. Scleroon Benth. ex Lindl., Bot. Reg. 29: Misc. 65. 1843. Citharexylum L. ex Walp., Repert. 6: 690. 1847. Cytharexylon L. ex C. Gay, Hist. Fis. Chile Bot. 5: 33--34. 1849. Cytharexylum Mill. ex Sessé & Moc., La Naturaleza, ser. 2, 1: 103. 1889. Cacocalyx S. Wats., Proc. Amer. Acad. 24: 67, hyponym. 1889. Citharexylon Britton, N. Amer. Trees 825, sphalm. 1908. Cytharexylon Mill. ex Le Cointe, Amaz. Brasil. III Arv. & Pl. Uteis 349. 1934. Cisharescylum Mill. ex Moldenke, Prelim. Alph. List Invalid Names 15, in syn. 1940. Citharexylon Mill. ex Moldenke, Prelim. Alph. List Invalid Names 15, in syn. 1940. Cytarexilum Mill. ex Moldenke, Prelim. Alph. List Invalid Names 24, in syn. 1940. Cytarexylon Mill. ex Moldenke, Prelim.

Alph. List Invalid Names 24, in syn. 1940; Cabrera & Dawson, Rev. Mus. La Plata Bot., n. ser., 5: 356. 1944. Cytharexilum Mill. ex Moldenke, Prelim. Alph. List Invalid Names 24, in syn. 1940. Marexylon Zucc. ex Moldenke, Prelim. Alph. List Invalid Names 32, in syn. 1940. Atharexylum Mill. ex Moldenke, Suppl. List Invalid Names 1, in syn. 1941. Citharexalum Mill. ex Moldenke, Suppl. List Invalid Names 2, in syn. 1941. Cutarexilum Sessé & Moc. ex Moldenke, Suppl. List Invalid Names 3, in syn. 1941. Cithaexylum Roig, Plant. Medic. 778. 1945. Vitharexylum O. E. Schulz ex Moldenke, Alph. List Cit. 1: 160, sphalm. 1946. Citarexylon Mill. ex Moldenke, Alph. List Invalid Names Suppl. 1: 4, in syn. 1947. Cithaexylon Roig ex Moldenke, Alph. List Invalid Names Suppl. 1: 4, in syn. 1947. Citharexilon Harvey ex Moldenke, Alph. List Invalid Names Suppl. 1: 4, in syn. 1947. Citharexyllum Combs ex Moldenke, Alph. List Invalid Names Suppl. 1: 4, in syn. 1947. Citharoxylum Combs ex Moldenke, Alph. List Invalid Names Suppl. 1: 5, in syn. 1947. Citharoxylon Hort. ex Moldenke, Alph. List Invalid Names Suppl. 1: 5, in syn. 1947. Cytarexylum Kuhlmann apud Occhioni, Lilloa 17: 484, sphalm. 1949. Cithaexylum A. Gray ex Moldenke, Alph. List Cit. 3: 683, sphalm. 1949. Cithareelum Cham. ex Moldenke, Alph. List Cit. 4: 1066, sphalm. 1949. Citarexylum Mill. ex Alain in León & Alain, Fl. Cuba 4: 298. 1957. Citharerexilum Cham., in herb. Cytarexilon Sessé & Moc., in herb. Cytharexyllum Mill., in herb. Merexylon Zucc., in herb. Turncasa Ruiz & Pav., in herb.

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Trees or shrubs, rarely climbing; branches and branchlets usually tetragonal, sometimes spiny; leaf-scars mostly large, corky, and elevated, borne on more or less prominent sterigmata; leaves decussate-opposite or verticillate, rarely approximate, subopposite, or even alternate, deciduous, exstipulate, petiole or sessile, entire or dentate, usually bearing a pair of prominent glands at the base of the blade; petioles rarely myrmecophilous at the apex; inflorescence indeterminate, racemiform or spicate, axillary and terminal, mostly elongate and many-flowered, rarely reduced to only a few flowers, erect or nutant, mostly simple, occasionally sparsely branched; flowers small, each subtended by a tiny inconspicuous bractlet; calyx tubular or cyathiform, regular or somewhat zygomorphic, thin, accrescent, its rim truncate and entire to 5-toothed or -lobed; corolla infundibular or hypocrateriform, mostly yellow or white, varying to blue, violet, or lilac, its tube narrow-cylindric and regular, its limb spreading, usually 5-parted, rarely 4- or 6-parted, with broad slightly irregular lobes, the 2 hindermost outermost in prefloration, mostly more or less pubescent in the throat; stamens 4, didynamous, inserted at or above the middle of the corolla-tube, included, a fifth stamen represented by a very rudimentary staminode, or occasionally stamens 5 or even 6; filaments very short; anthers ovate or sagittate, introrse, erect, with 2 parallel thecae opening by longitudinal slits and a thickened connective which often surpasses the thecae in length; style ter-

minal, included, often thickened toward the apex; stigma very shortly bifid; ovary perfectly or imperfectly 4-celled, composed of 2 carpels, each cell containing one lateral anatropous ovule; fruiting-calyx conspicuously enlarged and indurated, cupuliform or patelliform, shorter than the fruit; fruit drupaceous, with a juicy exocarp and a hard endocarp, with two 2-celled and 2-seeded pyrenes, which are often separated by a median fissure.

The genus contains about 130 valid species, varieties, and natural hybrids, ranging from Bermuda, Florida, and Texas through Mexico, Central America, and the West Indies to central Argentina and Uruguay. Several fossil forms are known from the Tertiary formations of the United States, Colombia, and Italy. The type species is C. spinosum L. Thirty-one species and varieties are or have been cultivated in various parts of the Old and New Worlds, the most common being C. spinosum, cultivated on every continent of the world and on many islands of the sea.

In Bentham's time (1876) only about twenty species were known in the genus, and Briquet, writing in 1894, also recognized only a similar number. Even Skottsberg, writing in 1956, calls it a neotropical genus of about 20 species. The generic name is derived from the Greek "kithara", a lyre, and "xulon", wood. The genus is a member of Tribe 6, Citharexyleae Briq., in Subfamily 1, Verbenoideae Briq. -- the only subfamily, according to Junell, which deserves to remain in the family Verbenaceae. Yet the genus was placed in the family Labiatae [=Lamiaceae], section Verbeneae, by Reichenbach in Mössler, Handb. Gewächsk., ed. 1, 1:xxxvi (1827) and ed. 3, 1:lxv (1833) and in his Conspect. Reg. Veg. 1: 117 (1828).

The scientific name of the genus has been variously spelled by authors and by herbarium workers; sometimes in several ways in the same publication -- e.g., Adanson in his Fam. Pl. (1763) spells it "Kitarexulon" on page 12 and "Citharexylon" on page 200, and Lombardo in his Invent. Pl. Cult. Montevid. (1941) spells it "Citharexylum" on pages 67 and 266 and "Citharexylon" on page 248. The name is said to have been proposed first by Philip Miller in his Gard. Dict., ed. 6, page 175 (1752), and is accredited to him by Jackson in the Index Kewensis. This, however, is a pre-linnean work and does not enter into nomenclatural priority under the present edition of the International Rule of Nomenclature. I am following Bentham, Briquet, Schulz, and Greenman in adopting the strict Latin form of the name, as was done also by Linnaeus in the first edition of his Species Plantarum (where he does not accredit the name to anyone) in 1753, notwithstanding the fact that Linnaeus used the Greek termination in his Genera Plantarum in 1754 and in his Dissertation defended by C. M. Dassow as far back as 1747, where he accredits the name to Bernard de Jussieu. Greenman correctly points out that the pre-linnean spelling of the name was always in the Greek form except when used by Miller.

Many popular and vernacular names have been recorded for the genus as a whole. Antoine Laurent de Jussieu, in his Gen. Pl. 119--123 (1789), proposed the French names "bois de guitare" and

"guitarin"; Necker, in *Elem. Bot.* 1: 362--389 (1790), proposed "citharexylone"; Willdenow in 1797 proposed the German name "Geigenholz"; Mirbel in *Hist. Nat. Pl.*, ed. 3, 15: 221 (1805) calls the members of the genus "cotelets", while Poiret in *Lam., Encycl. Méth. Bot. Suppl.* 2: 279 & 367 (1811) uses the singular form "cotelet" for them. The same author, in *Dict. Sci. Nat.* 9: 284 (1817) uses the names "bois de guitare", "cotelet", and "guitardin". Gay, in his *Hist. Fis. Chile Bot.* 5: 33 (1849), proposes the Spanish name "citarexilon". Gerth van Wijk in 1911 added the names "bois à cotelettes", "bois cotelet", "bois de guitard", "bois fidèle", "bois guitarin", "fiddle wood", "fiddle wood tree", "Geigenholzbaum", "guitar wood", "Leierholz", "susanna", and "vedelhoutboom". The Harrars, in their *Guide to Southern Trees* 648 (1946) record the name "nightshades". Sessé & Mociffo, in their *Fl. Mex.*, ed. 1, 166 (1895), say "Vulgo Chachalaca quia illume expetunt huius nominis Phasiani". They also state that the flowers vary to violet in color. Moldenke, in *Phytologia* 2: 95 (1944) adds "fiddle-wood", "fiddlewood", "fiddlewood tree", "fidelle-wood", "fiolintraee", "fioltraed", "gigatraed", "gigetraee", "le bois cotelet", "le bois de guitard", "le cotelet", "vedel houthboom", and "zither-wood".

Quite a few authors state that the group is called "fiddle-wood" because the wood is employed to make fiddles, violins, or other musical instruments. Jussieu and Linnaeus apparently believed this to be true when they adopted the name *Citharexylum* for it. The true situation, however, seems to be that the early French explorers in the West Indies referred to the native species there as "bois fidèle", signifying a faithful, true, or trustworthy tree, because of the use of its wood in home construction. The English later corrupted this to "fidelle-wood" and then "fiddle-wood", and, on the basis of this name, Jussieu and Linnaeus made up the scientific generic name from the Greek equivalents. Actually, the wood is not used in the manufacture of fiddles or any other musical instruments anywhere.

The wood anatomy and common names for the genus are discussed by Record & Mell in their *Timbers of Tropical America*, 523--528 (1924). Junell, in *Symb. Bot. Upsal.* 4: 46--48 (1934) discusses the gynoeceum morphology. Bentham points out in *Benth. & Hook. f., Gen. Pl.* 2 (2): 1149 (1876) that Ruiz & Pavon's *Rauwolfia*, consisting of *Citharexylum flexuosum* (Ruiz & Pav.) D. Don and *C. montevidense* (Spreng.) Moldenke, is a small group in the genus which resembles *Rhaphithamnus* Miers in habit. I assume that he makes this statement because of the spinose stems and branches of these two species -- and of several more recently described species from western South America. The resemblance, however, is very superficial.

Poiret points out in *Lam., Encycl. Méth. Bot. Suppl.* 2: 367 (1811) that the details of the fruit illustrated under letters g to o in *Lam., Illustr. pl.* 545, fig. 2 (1797) pertain to *C. paniculatum* Gaertn., which is actually not a member of this genus at all, but is *Petitia domingensis* Jacq. The same statement ap-

plies equally well to the illustration in Gaertn., Fruct. & Sem. 1: pl. 56 (1788).

In the Linnean Herbarium in London the brown cover which includes the genus cover is labeled "Cytharexylon", but Linnaeus' actual genus cover within it has the name spelled "Citharexylon". It is genus number 777. Specimen number "1" in this cover is unnamed, but a later hand has added "Morus tinctoria G." [=Gray]. Specimen number "2" is labeled "cinereum" in Linnaeus' handwriting; a later note added by Smith says "Nova planta....Plantae surin. non Syst."; it is actually a species of Schlegelia in the Bignoniaceae. Specimen number "3" is unnamed and is also a species of Schlegelia. Specimen number "4" is unnamed and bears the notation in Linnaeus' handwriting "Ko. 89" [=König]; it is also a species of Schlegelia. Specimen number "5" is labeled "caudatum" in Linnaeus' handwriting, and certainly is what we know as Citharexylum caudatum L. today; it bears the notation "Br" [=Browne] in Linnaeus' handwriting. Smith apparently struck out the name "caudatum" in pencil and then later rewrote it. Patrick Browne's herbarium was purchased for Linnaeus in 1758.

The Poeppigia Bert. included in the synonymy of Citharexylum by Jackson and other authors is actually a synonym of the genus Rhaphithamnus. That it is not congeneric with Citharexylum was pointed out already by Meisner in Pl. Vasc. Gen. 2: 199 (1840).

The "Jacq. Ic. Pl. Rar. ed. 1, 4, pl. 82. 1781" cited by O. E. Schulz in Urb., Symb. Ant. 6: 63 (1909) appears to be a preliminary edition of this famous work by Jacquin, distributed by him to a certain select few of his friends. The botanical garden at Berlin apparently had a copy of this edition in 1909, but it was destroyed in World War II. According to Dr. Humbert, who very kindly looked up the matter for me in Paris, there is still a copy of this edition in the Bibliothèque Nationale in Paris "sur la cote 5.977". Plate 82 in this work is actually a Citharexylum (see under C. fruticosum var. villosum), while that plate in the ordinary edition is a Dianthus species.

The "Citharexylum sp. (det. Moldenke)" of Svenson, Am. Journ. Bot. 33: 480 (1946) is actually C. svensonii Moldenke and the specimen which he cites is the type collection, as was originally reported by me to the collector when he was preparing this report. The "Citharexylum sp." of Stellfeld, Trib. Farmac. 19 (10): 164 (1951) is C. myrianthum Cham. The "Cytharexylon" referred to by Le Cointe in his O Estado do Para, p. 239 (1945) under the name of "pau de viola", whose wood is used for domestic, civil, and industrial construction, may also be C. myrianthum, since this is the species to which the name "pau de viola" is commonly applied in other parts of Brazil. If so, the wood is probably imported into Pará, because the species is known to grow wild in Brazil only from Pernambuco south to Rio Grande do Sul.

The Little 8199 distributed as Citharexylum sp. is not verb-

enaceous; it is probably a member of the Rubiaceae. Similarly, Edw. Palmer 423, also distributed to herbaria as a species of Citharexylum, is Bunchosia biocellata Schlecht. in the Malpighiaceae, while Spruce 6223 is a species of Schlegelia, The Ehrenberg s.n. from "S. Domingo", determined originally as Myginda microphylla DC. and re-determined as possibly a Citharexylum species by Britton, is actually Rhacoma gonoclada Urb. in the Celastraceae.

On the other hand, specimens that are actually Citharexylum have been misidentified in herbaria as Sideroxylon spp. in the Sapotaceae and as Basistemon brasiliensis Moldenke in the Scrophulariaceae.

Species excluded from the genus are the following:

- Citharexylum ? mendocinum R. A. Phil. = Grabowskia sp., Solanaceae
Citharexylum cyanocarpum Hook. = Rhaphithamnus spinosus (A. L. Juss.) Moldenke
Citharexylum calycinum Sx. = Seguiera floribunda Benth., Phytolaccaceae
Citharexylum caudatum Hort. = Buddleia melliodora Kunth & Bouché, Loganiaceae
Citharexylum cyanocarpa Hook. & Arn. = Rhaphithamnus spinosus (A. L. Juss.) Moldenke
Citharexylum cyanocarpon Hook. & Arn. = Rhaphithamnus spinosus (A. L. Juss.) Moldenke
Citharexylum cyanocarpum C. Gay = Rhaphithamnus spinosus (A. L. Juss.) Moldenke
Citharexylum cyanocarpum Hook. = Rhaphithamnus spinosus (A. L. Juss.) Moldenke
Citharexylum cyanocarpum Hook. & Arn. = Rhaphithamnus spinosus (A. L. Juss.) Moldenke
Citharexylum cyanocarpum Schlecht. & Cham. = Rhaphithamnus spinosus (A. L. Juss.) Moldenke
Citharexylum dentatum Lodd. = ? [said to be from "Ind. or."]
Citharexylum elegans Phil. = Rhaphithamnus venustus (R. A. Phil.) B. L. Robinson
Citharexylum germaini Briq. = Diostea juncea (Gill. & Hook.) Miers
Citharexylum melanocardium Sw. = Petitia domingensis Jacq.
Citharexylum ? mendocinum R. A. Phil. = Grabowskia sp., Solanaceae
Citharexylum mertensianum Rupr. = Rhaphithamnus spinosus (A. L. Juss.) Moldenke
Citharexylum paniculatum Gaertn. = Petitia domingensis Jacq.
Citharexylum ramizii Glaz. = Schlegelia ramizii (Glaz.) Sandw., Bignoniaceae
Citharexylum sericeum Lodd. = ? [said to be from "Ind. or."]
Citharexylum spicatum Rusby = Aegiphila spicata (Rusby) Moldenke

- Citharexylum tenuifolium Forst. = Myoporum tenuifolium Forst.,
Myoporaceae
- Citharexylum venustum R. A. Phil. = Rhaphithamnus venustus (R. A. Phil.) B. L. Robinson
- Citharexylum verticillatum Don = Rhaphithamnus spinosus (A. L. Juss.) Moldenke
- Citharexylum alpinum Poepp. = Diostea cinerascens (Schau.) Moldenke
- Citharexylum buxifolium (Willd.) Spreng. = Clerodendrum buxifolium (Willd.) Spreng.
- Citharexylum caudatum Hort. = Buddleia melliodora Kunth & Bouché,
Loganiaceae
- Citharexylum cyanocarpum C. Gay = Rhaphithamnus spinosus (A. L. Juss.) Moldenke
- Citharexylum cyanocarpum Hook. & Arn. = Rhaphithamnus spinosus (A. L. Juss.) Moldenke
- Citharexylum coeruleum Dombey = Rhaphithamnus spinosus (A. L. Juss.) Moldenke
- Citharexylum elegans Phil. = Rhaphithamnus venustus (R. A. Phil.) B. L. Robinson
- Citharexylum emarginatum Briq. = Clerodendrum buxifolium (Willd.) Spreng.
- Citharexylum flexuosum var. subglabrum Moldenke = Lycium subglabrum (Moldenke) Moldenke, Solanaceae
- Citharexylum germaini Briq. = Diostea juncea (Gill. & Hook.) Miers
- Citharexylum linearifolium Moldenke = Baillonia amabilis Bocq.
- Citharexylum macadripin Standl. = Rehdera trinervis (Blake) Moldenke
- Citharexylum macrocarpum Standl. = Rehdera trinervis (Blake) Moldenke
- Citharexylum melanocardium Sw. = Petitia domingensis Jacq.
- Citharexylum menalocardium Sw. = Petitia domingensis Jacq.
- Citharexylum mendocinum R. A. Phil. = Grabowskia sp., Solanaceae
- Citharexylum mollicellum Standl. = Rehdera mollicella Standl. & Moldenke
- Citharexylum nigrum Forst. = Petitia domingensis Jacq.
- Citharexylum ovalifolium Hornemann = Laguncularia racemosa (L.) Gaertn., Combretaceae
- Citharexylum ovatum Turcz. = Rhaphithamnus spinosus (A. L. Juss.) Moldenke
- Citharexylum paniculatum Gaertn. = Petitia domingensis Jacq.
- Citharexylum paniculatum Poir. = Premna obtusifolia R. Br.
- Citharexylum panniculatum Gaertn. f. = Petitia domingensis Jacq.
- Citharexylum penninervium Standl. = Rehdera penninervia Standl. & Moldenke
- Citharexylum perforatum Forst. = Myoporum tenuifolium Forst.,
Myoporaceae

- Citharexylum peruvianum Moldenke = Aloysia ayacuchensis Moldenke
Citharexylum pinninervium Standl. = Rehdera penninervia Standl. & Moldenke
- Citharexylum ramizii Glaz. = Schlegelia ramizii (Glaz.) Sandw., Bignoniaceae
- Citharexylum rugosum Forst. = Petitia domingensis Jacq.
- Citharexylum scandens Briq. = Schlegelia scandens (Briq. & Spruce) Sandw., Bignoniaceae
- Citharexylum scandens Briq. & Spruce = Schlegelia scandens (Briq. & Spruce) Sandw., Bignoniaceae
- Citharexylum tejucense Briq. = Brunfelsia ramosissima Pohl, Solanaceae
- Citharexylum tenuifolium Forst. = Myoporum tenuifolium Forst., Myoporaceae
- Citharexylum trinerve Blake = Rehdera trinervis (Blake) Moldenke
- Citharexylum verticillatum Don = Rhaphithamnus spinosus (A. L. Juss.) Moldenke
- Citharexylum verticillatum Klotzsch = Rhaphithamnus spinosus (A. L. Juss.) Moldenke
- Cytharexylon cyanocarpum Hook. & Arn. = Rhaphithamnus spinosus (A. L. Juss.) Moldenke

Genera in the above list of excluded species not referred to other families are members of the Verbenaceae. The two binomials of Loddiges, C. dentatum and C. sericeum, are accredited to him by Steudel in Nom. Bot., ed. 2, 1: 375 (1840). They are extremely puzzling names. They have been completely ignored by the authors of the Index Kewensis, and exhaustive search through the publications of Loddiges has failed to reveal any mention of them. If they apply to Asiatic plants, as the expression "Ind. or." appears to indicate, they cannot be members of the genus Citharexylum unless they were based on cultivated material. Since Loddiges dealt mostly with cultivated material, this might well be possible. It is to be hoped that more information about these names and the plants for which they were proposed will eventually be forthcoming.

In the preparation of this treatment 6473 herbarium specimens have been examined and annotated and 854 mounted photographs and clippings. Included have been the type collections -- and in most cases the actual holotypes -- of almost all the names involved. In the case of the fossil species and a very few obscure recent species, the type collections have not as yet been made available to me for examination.

In the next part a key will be given. This is an artificial key to the 130 accepted species, varieties, and hybrids of the genus Citharexylum as regarded by me at the present writing. This key is strictly dichotomous. To save space on the pages, however, the lines will not be indented as far to the right of the left-hand margin as they should be. Each line being numbered, it will still be easy to find the appropriate opposite line.