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Types of *Garcinia* L. (Clusiaceae) in the herbarium W (Naturhistorisches Museum Wien)

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Abstract

Garcinia L. is the second largest genus in Clusiaceae LINDL.; however, there are few recent taxonomic works about it, except for the taxonomic works conducted in Africa. For the development of sound taxonomic work and to allow nomenclatural changes and typifications, a thorough analysis of the type specimens of validly published names is necessary. In the herbarium W (Naturhistorisches Museum Wien) nomenclatural type specimens for 50 taxons of *Garcinia* (Clusiaceae) are identified. Data from: the original publication, herbarium number and, where possible, the taxonomic status are provided.

Key words: Clusiaceae; *Clusianthemum*, *Rheedia*, *Ochrocarpos*, *Terpnophyllum*, *Xanthochymus*; types.

Zusammenfassung

Garcinia L. ist die zweitgrößte Gattung der Familie Clusiaceae LINDL. Außer einer rezenten Bearbeitung der afrikanischen Arten gibt es noch keine umfassenden taxonomischen Abhandlungen. Für eine fundierte taxonomische Bearbeitung ist es notwendig, Typus-Material zu allen publizierten Namen zu analysieren, um die Nomenklatur klären zu können. Im Herbarium W (Naturhistorisches Museum Wien) wurden Typus-Belege für 50 Taxa der Gattung *Garcinia* gefunden und gekennzeichnet. Im Folgenden wird eine Auflistung der Belege inklusive Protolog-Zitat, Herbariumsnummer und, wo es möglich war, auch des taxonomische Status des jeweiligen Taxons angegeben.

Introduction

Garcinia L. is the second largest genus of Clusiaceae and has about 250 species distributed throughout tropical regions with the highest concentration in the Paleotropics (SWEENEY 2008). In recent years some taxonomic studies have been conducted, example in Africa by ROGERS & SWEENEY (2007), SWEENEY & ROGERS (2008), and SOSEF & DAUBY (2012). The treatments contain in-depth taxonomic discussions, descriptions of new species and nomenclatural adjustments. New taxa have been described for Asia, most of them are from India by BEGUM et al. (2014), SABU et al. (2013), and SARMA et al. (2016). Nomenclatural adjustments were proposed by MEDELLÍN-ZABALA & MARINHO (2015) and SHAREEF & KRISHNARAJ (2015). For South and Central America taxonomic studies which involve *Garcinia* are still far from complete. The last floristic account involving the group was elaborated by VAN DEN BERG (1979), where the author described and illustrated the Brazilian species of the genus *Rheedia* L., currently all are included in *Garcinia*. Unfortunately, the author could not analyze the materials from the European and US herbaria.

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As the basis for taxonomic work it is essential to consult and analyze nomenclatural type material for as many taxa as possible. Modern digitization efforts, especially the Global Plants Initiative (<http://plants.jstor.org>) are very helpful for this purpose, but the data is still incomplete as type specimens are often not marked as such. Thus, investigative work is essential in collections that have, or have had, high importance in a given period of time. The herbarium of the Natural History Museum in Vienna, Austria, contains a high percentage of such historical material and many specimens represent nomenclatural types, but recent investigations are missing for numerous groups. The current study deals with the type material for the genus *Garcinia*, Clusiaceae, and lists the material that is found in the collections.

Material and Methods

During work for the project REFLORA the collections of the herbarium W (Naturhistorisches Museum Wien) have been checked for type specimens for taxa connected with the genus *Garcinia*. Suspicious specimens have been verified with the protologues.

Results and Discussion

During the analysis of specimens of *Garcinia* and all its synonyms nomenclatural types for 50 species were identified, these are considered under *Garcinia*. In total 68 specimens belong to one of the categories of types accepted by the International Code of Nomenclature (MCNEILL et al. 2012). The only specimens marked as types by previous investigators were: *Clusia pedicellata* G. FORST [= *Garcinia pedicellata* (G. FORST.) SEEM.], *Rheedia gardneriana* PLANCH. & TRIANA [= *Garcinia gardneriana* (PLANCH. & TRIANA) ZAPPI] and *Garcinia livingstonei* var. *pallidinervia* ENGL. [= *Garcinia pallidinervia* (ENGL.) ENGL.].

Most of the material originates from the Paleotropics: Africa and Asia, due to the intense work for regional floras conducted at specific points of these continents as: Flore Forestière de la Cochinchine (PIERRE 1883), Beiträge zur Flora von Afrika – Guttiferae africanae (ENGLER 1908, 1919) and *Garcinia* from Sibuyan Island (ELMER 1911). For most of the species more than one collection are cited in the protologue and therefore lectotypification will be necessary. Species from Madagascar and the Comoro Islands, and also from Gabon and Lower Guinea were recently reviewed by SWEENEY & ROGERS (2008) and SOSEF & DAUBY (2012), respectively. However, thorough studies are necessary of *Garcinia* species from Malaysia and New Caledonia. Recently lectotypes have been designated for some of the species listed here by SWEENEY & ROGERS (2008) and SOSEF & DAUBY (2012), but due to lack of evidence for the presence of the type materials in W, these specimens were not listed in the publications.

In the list below the types found in the collections are arranged in alphabetical order by their basionym. The actual name is given but many of the names are still not clearly assigned and given as “unresolved” in the Plantlist (2016). Names based on the same type are connected with ≡, names based on different types with =. Scans of all specimens are available in Virtual Herbaria (<http://herbarium.univie.ac.at/database/search.php>).

***Clusia* L.**

Clusia pedicellata G. FORST., Fl. Ins. Austr. Prodrumus 74 (1786).

≡ *Garcinia pedicellata* (G. FORST.) SEEM.

Typus: New Caledonia, s.l., s.d., J.G.A. Forster s.n. [W 0051538].

***Clusianthemum* VIEILL.**

Clusianthemum pedicellatum VIEILL., Bull. Soc. Linn. Normandie 9: 339 (1865).

Typus: New Caledonia, Herb. de la Nouvelle-Calédonie, s.l., s.d., “E. Vieillard” 2085 [W 0073381].

Taxonomic status: Though they have the same epithet *Clusia pedicellata* and *Clusianthemum pedicellatum* are based on different types and not identical. Apparently, there is some confusion in the identification of the specimens of *Clusia pedicellata* (≡ *Garcinia pedicellata*) and *Clusianthemum pedicellatum*. The type specimen of *C. pedicellatum* from herbarium P has the annotation “*Garcinia pedicellata* SEEM.”, which seems to have been made by Pierre. Most probably this was a simple error as this combination (*Garcinia pedicellata*) is currently referred to the basynonym *Clusia pedicellata*.

***Garcinia* L.**

Garcinia amplexicaulis VIEILL. ex PIERRE, Fl. Forest. Cochinch. 5: 20 (1883).

Typus: New Caledonia, Herb. de la Nouvelle-Calédonie, s.l., 1861–67, “E. Vieillard” 2363 [W 1889-0053229].

Garcinia anomala PLANCH. & TRIANA, Ann. Sci. Nat., sér. 4, Bot. 14: 329 (1860).

Syntypi: India, Khasya, dans le norde-est de l’Inde anglaise, s.d., W. Griffith 848 [W 0073367]; J.D. Hooker & T. Thomson 14 [W 0073366, W 1889-0318023, W 1889-0318024, W 1889-0318030].

Garcinia baillonii PIERRE, Fl. Forest. Cochinch. 5: 18 (1883).

Typus: Malaysia, Sarawak, habite l’île de Bornéo, s.d., O. Beccari 2498 [W 0073365].

Garcinia blumei PIERRE, Fl. Forest. Cochinch. 5: 32 (1883).

Typus: Malaysia, Sarawak, habite l’île de Bornéo, s.d., O. Beccari 2549 [W 0073364].

Garcinia brasiliensis MART., Flora 24(2): 34 (1841).

Typus: Brazil, “Rio de Janeiro”, prope Praya Copacabana, s.d., C.F.P. Martius 481 [W 1889-0318053].

Taxonomic status: Accepted name – BFG (2015).

Garcinia calycina KURZ, J. Bot., British and Foreign 13: 324 (1875).

Typus: India, Nicobar Island, s.d., S. Kurz s.n. [W 0073376].

Garcinia chromocarpa ENGL., Bot. Jahrb. Syst., 40: 561 (1908).

≡ *Garcinia quadrifaria* var. *chromocarpa* (ENGL.) SOSEF & DAUBY – SOSEF & DAUBY (2012).

Typus: Cameroon, Bipinde, Urwaldgebiet, III.1904, G. Zenker 2835 [W 1905-0001942].

Garcinia comorensis DRAKE, Bull. Mens. Soc. Linn. Paris 2: 1221 (1897).

Typus: Madagascar, Lac de Nossi-Vé, 11.IV.1882, J. Humblot 144 [W 1889-0084547].
= *Garcinia goudotiana* (Planch. & Triana) P. Sweeney & Z.S. Rogers – ROGERS et al. (2011).

Garcinia conrauana ENGL., Bot. Jahrb. Syst., 40: 562 (1908).

Typus: Cameroon, Bipinde, Urwaldgebiet, 1903, G. Zenker 2552 [W 1903-0008681].

Taxonomic status: Accepted name – SOSEF & DAUBY (2012).

Garcinia corallina VIEILL., Bull. Soc. Linn. Normandie 9: 338 (1865).

Typus: New Caledonia, Herb. de la Nouvelle-Calédonie, s.l., 1862, “E. Vieillard” 2083 [W 0073363, W 1889-0053257].

Garcinia densivenia ENGL., Bot. Jahrb. Syst., 40: 563 (1908).

Isotypus: Cameroon, Bipinde, Urwaldgebiet, 1903, G. Zenker 2547 [W 1903-0008705].

Taxonomic status: Accepted name. – SOSEF & DAUBY (2012). The collection from G herbarium [G 00018874] was designated as lectotype by SOSEF & DAUBY (2012).

Garcinia desrousseauxii PIERRE, Fl. Forest. Cochinch. 5: 18 (1883).

Typus: Malaysia, Sarawak, habite l’île de Bornéo, s.d., O. Beccari 2573 [W 0073362].

Garcinia echinocarpa THWAITES, Hooker’s J. Bot. Kew Gard. Misc. 6: 71 (1854).

Typus: Sri Lanka, Ceylon, 1868, G. Thwaites 335 [W 0073360, W 1889-0063329, W 1889-0130058].

Garcinia fascicularis WALL. ex VESQUE, Monographiæ phanerogamarum vol 8: 376, (t. 115 in Epharosis II) (1893).

Typus: Malaysia, Penang G. Porter, 1836, N. Wallich 4853 [W 0073359].

Garcinia gerrardii HARV. ex SIM, Forest Fl. Cape: 141 (1907).

Typus: South Africa, Port Natal, s.d., W.T. Gerrard 1181 [W 1889-0318020].

Garcinia gitingensis ELMER, Leafl. Philipp. Bot. 3: 1053 (1911).

Typus: Philippines, Magallanes (Mt. Giting-giting), Province Capiz, Island of Sibuyan, V.1910, A.D.E. Elmer 12213 [W 1912-0000852], A.D.E. Elmer 12482 [W 1912-0000851], A.D.E. Elmer 12526 [W 1912-0000963].

Garcinia griffithii T. ANDERSON, Fl. Brit. India 1: 266 (1874).

Typus: Malaysia, “Birma and Malay” Eastern Peninsula, Mt. Ophir near Malacca, “1861-2”, W. Griffith 861 [W 0073358].

Garcinia gynotrochoides ELMER, Leafl. Philipp. Bot. 10: 3747 (1939).

Typus: Philippines, Irosin (Mt. Bulusan), Province of Sorsogon, Island of Luzon, XI.1915, A.D.E. Elmer 15604 [W 1925-0000583].

Garcinia jelinekii KURZ, J. Asiat. Soc. Bengal, Pt. 2, Nat. Hist. 45(2): 118 (1876).

Typus: India, Nicobar Island, Tillangchong, s.d., Novara 169 / L. Jelinek 106 [W 0073376].

Note: In many online databases (e.g. tropicos.com; ipni.org) the name of this species has been written as “*Garcinia jelinckii*”. However, analyzing the protologue it is possible to verify that the correct spelling of the species is *G. jelinekii*.

Garcinia linearifolia ELMER, Leafl. Philipp. Bot. 3: 1051 (1911).

Typus: Philippines, Magallanes (Mt. Giting-giting), Province Capiz, Island of Sibuyan, IV.1910, A.D.E. Elmer 12196 [W 0073357].

Garcinia livingstonei var. *pallidinervia* ENGL., Bot. Jahrb. Syst. 55: 389 (1919).

≡ *Garcinia pallidinervia* (ENGL.) ENGL.

Typus: Tanzania, Nyassa Hochland, station Kyimbila, 1913, A. Stolz 2237 [W 1915-0007899].

Garcinia mbulwe ENGL., Bot. Jahrb. Syst., 55: 391 (1919).

Typus: Tanzania, Nyassa Hochland, station Kyimbila, 1350 m, 17.X.1911, A. Stolz 933 [W 1915-0004982].

Garcinia miquelii PIERRE, Fl. Forest. Cochinch. 5: 26 (1883).

Typus: Malaysia, Sarawak, habite l'île de Bornéo, s.d., O. Beccari 1485 [W 0073353].

Garcinia nigrolineata PLANCH. ex T. ANDERSON, Fl. Brit. India 1: 263 (1874).

Typus: Malaysia, "Birma and Malay" Eastern Peninsula, Malacca, 1861–2, W. Griffith 854 [W 0073380].

Garcinia nitida PIERRE, Fl. Forest. Cochinch. 5: 18 (1883).

Typus: Malaysia, Sarawak, habite l'île de Bornéo, s.d., O. Beccari 2104 [W 0073379].

Garcinia palawanensis ELMER, Leaf. Philipp. Bot. 5: 1791 (1911).

Typus: Philippines, Puerto Princesa (Mt. Pulgar), Province of Palawan, Island of Palawan, IV.1911, A.D.E. Elmer 13027 [W 1913-0006046].

Garcinia petiolaris PIERRE, Fl. Forest. Cochinch. 5: 3 (1883).

Typus: Malaysia, Sarawak: habite l'île de Bornéo, s.d., O. Beccari 1115 [W 0073378].

Garcinia rhizophoroides ELMER, Leaf. Philipp. Bot. 3: 1049 (1911).

Syntypi: Philippines, Magallanes (Mt. Giting-giting), Province Capiz, Island of Sibuyan, IV.–V.1910, A.D.E. Elmer 12538 [W 1912-0000982], A.D.E. Elmer 12528 [W 1912-0000983], A.D.E. Elmer 12185 [W 1912-0001184].

Garcinia sarawhensis PIERRE, Fl. Forest. Cochinch. 5: 6 (1883).

Syntypi: Malaysia, Sarawak, habite l'île de Bornéo, s.d., O. Beccari 2575 [W 0073369], O. Beccari 3670 [W 0073368].

Garcinia stipulata T. ANDERSON, Fl. Brit. India 1: 267 (1874).

Typus: Malaysia, "Eastern Himalaya", in moist subtropical forests Bhotan, 1861–2, W. Griffith 860 [W 0073370].

Garcinia sulphurea ELMER, Leaf. Philipp. Bot. 5: 1789 (1912 [1913]).

Typus: Philippines, Puerto Princesa (Mt. Pulgar), Province of Palawan, Island of Palawan, IV.1911, A.D.E. Elmer 12907 [W 1913-0006050].

Garcinia tenuipes ENGL., Bot. Jahrb. Syst. 55: 393 (1919).

Typus: Cameroon, Bipinde, Urwaldgebiet, 1911, G. Zenker 4135 [W 1912-0024477].

Garcinia yunnanensis H.H. HU, Bull. Fan Mem. Inst. Biol., Bot. 10(3): 131 (1940).

Typus: China, Yunnan, Che-li Hsein, 1000 m alt., VIII.1936, C.W. Wang 75525 / 73277 [W 1940-0007861].

Note: There are two collections mounted on one sheet. The number 75525 is marked as holotype.

Garcinia zenkeri ENGL., Bot. Jahrb. Syst. 40: 566 (1908).

Isotypus: Cameroon, Bipinde, Urwaldgebiet, 1896, G. Zenker 1120 [W 1897-0004708].

= *Garcinia densivenia* ENGL. – SOSEF & DAUBY (2012).

The collection from herbarium Geneva [G 00018871] was designated as lectotype by SOSEF & DAUBY (2012).

***Ochrocarpos* NORONHA ex THOUARS**

Ochrocarpos humblotii DRAKE, Bull. Mens. Soc. Linn. Paris 2: 1220 (1897)

Typus: Madagascar, Iles Comores, s.d., J. Humblot 391 [W 1889-0047775].

= *Garcinia commersonii* (PLANCHON & TRIANA) VESQUE – SWEENEY & ROGERS (2008).

Ochrocarpos macrophyllus O. HOFFMANN, Sert. Pl. Madagasc. 7 (1881).

Typus: Madagascar, “Nossi-komba”, XII.1879, J. Humblot 3239 [W 1889-0089816].

= *Garcinia decipiens* (BAILLON) VESQUE.

The collection from Paris herbarium [P 030818] was recently designated as lectotype to *Ochrocarpus macrophyllus* by SWEENEY & ROGERS (2008).

Ochrocarpos multiflorus O. HOFFMANN, Sert. Pl. Madagasc. 7 (1881).

Isotypus: Madagascar, “Nossi-komba, arbor ad littora maris floribus lacteis”, II.1880, J. Humblot 3337 [W 1889-0085715].

= *Garcinia evonymoides* (PLANCH. & TRIANA) P. SWEENEY & Z.S. ROGERS – ROGERS et al. (2011).

The collection from herbarium Geneva [G 00090050] was designated as lectotype to *Ochrocarpus multiflorus* by SWEENEY & ROGERS (2008), and the collection from herbarium Paris [P 00852334] was designated as lectotype to *Garcinia evonymoides* by ROGERS et al. (2011).

***Rheedia* L.**

Rheedia brasiliensis var. *salicifolia* CHODAT & HASSL., Bull. Herb. Boissier, sér. 2, tome 3: 1126 (1903).

Typus: Paraguay, prope Valenzuela, in regione cursus superioris fluminis Y-acá, I.1900, E. Hassler 7038 [W 1904-0000331].

= *Garcinia gardneriana* (PLANCH. & TRIANA) ZAPPI – VAN DEN BERG (1979), BFG 2015.

Rheedia fruticosa C. WRIGHT ex GRISEB., Cat. Pl. Cub. 38 (1866).

≡ *Garcinia serpentini* BORHIDI, Acta Bot. Acad. Sci. Hung. 26 (3–4): 261 (1981), non *Garcinia fruticosa* LAUTERB., Bot. Jahrb. Syst. 58: 31 (1922).

Typus: Cuba, prope San Marcos, 1860–1864, C. Wright 2120 [W 1889-0119791].

Rheedia gardneriana PLANCH. & TRIANA, Ann. Sci. Nat., sér. 4, Bot. 14: 321 (1860).

≡ *Garcinia gardneriana* (PLANCH. & TRIANA) ZAPPI – BFG (2015).

Typus: Brazil, Ceará “or Piauí”, s.d., G. Gardner 1922 [W 0062441, W 1889-0318018].

Rheedia longifolia PLANCH. & TRIANA, Ann. Sci. Nat., sér. 4, Bot. 14: 322 (1860).

Typus: Brazil, Près de Panure, rio Uaupes, 1852, R. Spruce 2441 [W 1889-0111933, W 1889-0318026].

Rheedia martinii MAGUIRE, Bull. Torrey Bot. Club 75(4): 437 (1948).

Typus: Surinam, Tafelberg, Table Mountain, 20.VIII.1944, B. Maguire 24427 [W 1956-0014782].

Rheedia portoricensis URB., Symb. Antill. 1(2): 368 (1899).

≡ *Garcinia portoricensis* (URB.) ALAIN – LIOGIER (1986).

Typus: Puerto Rico, prope San Juan in litoralibus ad Cangrejos. 6.IV.1885, I. Urban 929 [W 1900-0000579].

Rheedia ruscifolia GRISEB., Plantae Wrightianae 1: 167 (1860).

≡ *Garcinia ruscifolia* (URB.) BORHIDI, Acta Bot. Acad. Sci. Hung. 26 (3–4): 262 (1981).
 Typus: Cuba, “prope villam, Monte Verde dictam”, I.–VII.1859, C. Wright 53 [W 1889-0092967].

Rheedia spruceana ENGL., Fl. Bras. 12(1): 463 (1888).

Typus: Peru, prope Tarapoto, Peruviae orientalis, 1855–6, R. Spruce 4484 [W 1889-0318025]

= *Garcinia gardneriana* (PLANCH. & TRIANA) ZAPPI – VAN DEN BERG (1979).

***Terpnophyllum* THWAITES**

Terpnophyllum zeylanicum THWAITES, Hooker’s J. Bot. Kew Gard. Misc. 6: 70, t. 2, f. 1 (1854).

≡ *Garcinia terpnophylla* THWAITES, Enum. Pl. Zeyl. 406 (1864).

Typus: Sri Lanka, Ceylon, Central Province, 18XX (illegible date), G. Thwaites 2695 [W 0073371, W 0073372, W 0073373, W 1889-0130062, W 1889-0134579].

Note: The sheets W 0073372 and W 0073373 have no labels. At some time in the past it was (bad) curatorial behavior to file duplicates without copying the labels. Such duplicates of the same collection can be identified comparing the color of the dried plants, the paper and the style of mounting.

Terpnophyllum zeylanicum var. *acuminatum* THWAITES, Enum. Pl. Zeyl. 49 (1858).

Typus: Sri Lanka, Ceylon, Central Province, 18XX (illegible date), G. Thwaites 3400 [W 0073374, W 1889-0139372].

= *Garcinia terpnophylla* THWAITES – THWAITES (1864).

***Xanthochymus* ROXB.**

Xanthochymus quadrifarius OLIV., Fl. Trop. Afr. 1: 168 (1868).

≡ *Garcinia quadrifaria* (OLIV.) PIERRE var. *quadrifaria*. – SOSEF & DAUBY (2012).

Typus: Gabon, West Trop. Africa, 1859–63, G. Mann 929 [W 0073377].

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