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Nomenclatural and taxonomic notes on *Annona* (Annonaceae)

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Abstract

In the course of monographic studies on the genus *Annona* (Annonaceae) some cases of nomenclatural and taxonomic changes and need for typifications turned up and are herewith presented. *Raimondia* is included in *Annona* due to its general resemblance in morphological and anatomical characters, its species already described as *Annona* are reestablished, and one new combination is made. The new combinations are *Annona cacans* WARM. subsp. *glabriuscula* (R.E.FR.) H.RAINER and *Annona deceptrix* (WESTRA) H.RAINER.

Key words: Annonaceae, *Annona*, *Raimondia*, Flora Neotropica, typification.

Zusammenfassung

Während der monographischen Studien an der Gattung *Annona* (Annonaceae) wurden einige nomenklatorische und taxonomische Änderungen evident, sowie in einigen Fällen Typifizierungen notwendig, die hier präsentiert werden. Die Gattung *Raimondia* wird wegen ihrer weitgehenden Übereinstimmung in morphologischen wie anatomischen Merkmalen in *Annona* eingegliedert. Die schon unter *Annona* beschriebenen Arten werden wiederhergestellt und eine Neukombination durchgeführt. Die beiden Neukombinationen betreffen *Annona cacans* WARM. subsp. *glabriuscula* (R.E.FR.) H.RAINER und *Annona deceptrix* (WESTRA) H.RAINER.

Introduction

In the course of the studies for a monograph of the neotropical taxa of the genus *Annona* (Annonaceae), the number of collections increased substantially compared to the material available to FRIES (1931), the last comprehensive treatment of the genus. Changes in nomenclature and taxonomy became apparent and are herewith presented as a precursor to the monograph (RAINER, in prep).

The two main reasons for these changes were: 1) the closure of gaps in the geographic distribution (e.g., *Annona amambayensis* HASSLER ex R.E.FR. is now included in *Annona cacans* WARM. ssp. *glabriuscula* (R.E.FR.) H.RAINER), and 2) the variability of morphological characters and habit (e.g., *Annona tessmannii* DIELS now included in *Annona hypoglauca* MART.; *Raimondia* reduced to a synonym of *Annona*).

In the following paragraphs each case is treated and discussed in detail. Abbreviations used in the text are: fl = flowers, fr = fruit, and yfr = young fruits. The distinction between mature fruits (fr) and young fruits (yfr) is made, because size, shape, and consistency of mature fruits diverges much from that of immature stages.

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Annona L., Sp. pl.: 536 (1753).

Type species: *Annona muricata* L.

= *Raimondia* SAFF., Contr. U. S. Natl. Herb. 16 (5): 217 - 219, pl. 52, 53 (1913).

Type species: *Raimondia monoica* SAFF. (= *Annona cherimolioides* TRIANA & PLANCH.).

The genus was established by SAFFORD (1913) on the basis of a single species *Raimondia monoica* SAFF., distinct from *Annona* by unisexual flowers and aberrant stamen morphology (connective shield not prolonged nor dilated). This concept was subsequently followed by FRIES (1930) when he treated the genus in the series of "Monographien der Arten einiger Annonaceen Gattungen". FRIES then included 3 species in the genus, by reclassification of already established taxa. Later on he described one new species (FRIES 1959a), although already much earlier he expressed severe doubts about SAFFORD's concept (FRIES 1943). WESTRA (1995) in the latest concise treatment of the genus pointed out its questionable distinctiveness. In table 1 WESTRA compares qualitative flower morphological characters of *Raimondia* with those from all sections of *Annona*.

The monographic studies on the genus *Annona* by the present author revealed that floral characters used by SAFFORD do not support the generic status of *Raimondia*. Data from wood- (WELLE in WESTRA 1995), leaf- (SETTEN & KOEK-NOORMAN 1986) and seed-anatomy (HEIJDEN & BOUMAN 1988) also confirm the uniformity of the "*Annona* group", containing the genera *Annona*, *Raimondia*, and *Rollinia*. WALKER (1971) confirmed this uniformity in an ample palynological study for the whole family of Annonaceae, but indicated the distinct pollen of *Raimondia* with regard to its prominent tectal perforations. The structure of the ectexine in pollen of *Annona*, *Raimondia*, and *Rollinia* shows all transitions from tectate-perforate, with minute "pits", to coarsely reticulate (orig. data). Subsequently *Raimondia* is included here in *Annona*.

Annona amazonica R.E.FR., Acta Horti Berg. 10 (2): 266 (1931).

Type: Brazil, Pará, Obidos, inter lacum Mamauri et Castanhal de Paiol, silva non inundabili, 3 Dec 1926 (fl), **A. Ducke s.n.** (= **RB 19639**) [Holotype: S (photos: F, MO); Isotypes: K, US].

= *Annona amazonica* R.E.FR. var. *lancifolia* R.E.FR., Acta Horti Berg. 12 (3): 565 (1939).

Type: Brazil, Amazonas, Parintins, silva non inundabili, 4 Jan 1936 (fl), **A. Ducke s.n.** (= **RB 29020**) [Holotype: S; Isotype: MO].

Variety *lancifolia* was based on two specimens (Ducke s.n. = RB 29020; and Guedes s.n. = MG 1588 [as paratype]), which seemed distinct to FRIES by their narrower and glaucous leaves. At that time FRIES had only seen 5 collections, all from central Amazonia. Meanwhile many new collections turned up from Eastern Brazil throughout the Amazon to the borders of the Andes extending northwards to Costa Rica. The variability of the morphological characters, especially the shape of the leaves, could be studied in detail. *A. amazonica* produces tall trees, which are elements of the forest canopy, and possess different "sun-" and "shade-leaves", especially leaves from the upper parts of the crown fully exposed to direct sunlight are narrower and more glaucous. This pattern can also be observed in other Annonaceae (e.g. *Rollinia pittieri* SAFF.).

Annona bicolor URB., Symb. antill. VII: 223 - 224 (1912).

Type: Dominican Republic, Barahona, Apr 1910 (fl), **M. Fuertes 258** [Holotype: B (Herbarium Krug et Urban); Isotypes: B, BM, F (2 sheets), G, GH, K, L, LE, MO (n.v.), NY, P, S, US].

= *Annona bicolor* URB. forma *concolor* R.E.FR., Acta Horti Berg. 10 (2): 307 (1931).
Type: Dominican Republic, Peninsula de Barahona, Mare-a-Chat, quaternary limestone, 11 Sept 1926 (fl), **E.L. Ekman H6940** [Lectotype (designated here): S; Isolectotypes: A, B (n.v., destroyed), F].

Annona bicolor inhabits very dry areas on the island of Hispaniola. It is characterized by thin, broadly elliptic to obovate, often orbicular, and emarginate leaves, which are glaucous on the lower side. This glaucousness, a feature quite common in species of other groups of *Annona* as well, can best be seen in young leaves and is often vanishing with age. Forma *concolor* was based on a collection by Ekman, that lacks the distinct wax cover, and additionally was thought to be intermediate in the overall shape of the leaves. The numerous recent collections brought to light the variability of these characters and hence the taxonomic status of the forma was reconsidered.

Annona cacans WARM., Vidensk. Meddel. Dansk Naturhist. Foren. Kjøbenhavn, 1873: 155 (1873); fig. 1, 2.

Type: Brazil, Minas Gerais, Lagoa Santa, 25 Oct 1864 (fl), **E. Warming s.n.** [Lectotype (selected here): C]; – *ibid.*, 25 Apr 1864 (st), **E. Warming s.n.** [Syntype: C]; *ibid.*, Feb 18?? (fr), **E. Warming 463** [Syntype: C]; *ibid.*, s.d. (fl), **E. Warming s.n.** [Syntype: C].

In the original publication by WARMING (1873) no collection date is mentioned for the specimens, only some general remarks on phenology are made: "flore m. Oct. Nov. Fructus maturi Febr. - Aprili". FRIES (1931: 262) cited "Warming in herb. Haun.!" as type collection, again without date of collection. In the herbarium of Copenhagen (C) there are 4 specimens all with a simple printed label: "Legit Eug. Warming ad Lagoa Santa". Three specimens have additional labels in the handwriting of Warming, but were collected at different dates: the first specimen with flowers shows "25/10/64", this specimen is selected as lectotype (see fig. 1) because it provides the most complete information; the second is sterile, gives a description of the fruit and has number "463" but only "Februar" on the handwritten label; the third is sterile and has "25/4/64". The first and last of these three specimens have an additional stamp in red ink: "specimen originale". The fourth specimen bears flower buds but no date of collection and no handwritten label; probably this is a duplicate of the collection with flowers.

Warming's specimens were collected in a spot off the main distribution area of the species in the state of Minas Gerais (Brazil), and unfortunately differ from the vast majority of collections in the ferruginous indument of young leaves and twigs. Collections from the Mata Atlântica as well as from southern regions of Brazil and western Paraguay are glabrous, already in young stages. This fact was already clear to FRIES (1905) so he established a new variety *Annona cacans* WARM. var. *glabriuscula* R.E.FR., based on Dutra s.n. [Dec 1898]; a name already existed for this taxon, *A. quaresma* DUTRA ex R.E.FR., but a description was lacking (cf. FRIES 1931: 263).



Fig. 1: Lectotype of *Annona cacans* WARM. (E. Warming s.n. [C])

Although the overall resemblance of characters does not justify the establishment of these plants as a new species, the pattern of glabrous leaves is nevertheless constant throughout, and geographic isolation of the central Brazilian populations justifies an elevation of variety *glabriuscula* to the rank of a subspecies.

***Annona cacans* WARM. ssp. *glabriuscula* (R.E.FR.) H.RAINER, comb.n. et stat.n.**

≡ *Annona quaresma* DUTRA ex R.E.FR., nom. nud. (cf. FRIES 1931).

Type: Brazil, Rio Grande do Sul, prope São Leopoldo, Dec 1898 (fl), **J. Dutra s.n.** [Holotype: S; Isotype: S].

= *Annona amambayensis* HASSLER ex R.E.FR., Acta Horti Berg. 10 (2): 264 (1931).

Type: Paraguay, Amambay, in altiplanitie et declivibus Sierra de Amambay, Dec 1907 (fl, yfr), **T. Rojas 10729** [Holotype: G (photo: S); Isotypes: A, BM, C, F, G, GH, K, MICH (n.v.), MO, NY, P, S, SI (n.v.), UC (n.v.), US].

No morphological differences from *Annona cacans* ssp. *glabriuscula* could be detected. The Paraguayan collection sites in the provinces of Amambay and Canendiyú are connected with the Atlantic forests of Brazil by a corridor of forest patches through the savanna belt in the Brazilian states of Paraná and Santa Catarina (fig. 2).

***Annona cascarilloides* C.WRIGHT ex GRISEB., Cat. pl. Cub.: 2 (1866).**

Type: Cuba, Pinar del Río, paredones de San José, 10 Jun - 14 Aug 1862 (fl, fr), **C. Wright 1848** [Holotype: GOET (photo: A); Isotypes: B, G-DC, GH, HAC, K, MO (n.v.), NY, P].

= *Annona elliptica* R.E.FR., Ark. Bot. 21 A 9: 13, fig. 3: 1 - 3 (1927).

Type: Cuba, Pinar del Río, Sierra de Viñales, mogotes, 5 Jun 1923 (fl), **E.L. Ekman 16538** [Holotype: S (n.v., photo: NY); Isotypes: B, NY (fragm.)].

The name *Annona elliptica* R.E.FR. was applied by FRIES to a single collection gathered in the Mogote-region in Pinar del Río, Cuba. The type collections for both taxa do not show any significant differences, except the yellowish indument on the outside of the outer petals in *A. elliptica*. Recent observations in the field and consultation of the local herbaria proved the existence of only one taxon in the area. LÉON & ALAIN (1946, 1951) could not mention any significant differences for these two taxa as well, both names were though left as distinct taxa in the treatment for the Flora of Cuba, but not included in the accompanying key.

***Annona cherimolioides* TRIANA & PLANCH., Ann. Sci. Nat. Bot., sér. 4., 17: 27 (1862).**

≡ *Raimondia cherimolioides* (TRIANA & PLANCH.) R.E.FR., Acta Horti Berg. 10 (1): 82 (1930).

Type: Colombia, Antioquia, Manizales, alt. 2140 m [!], s.d. (fl), **J. Triana s.n.** [Lectotype: P; Isolectotypes: BM, P]; – Colombia, Tolima, Ibagué, 1844 (yfr), **J. Goudot s.n.** [Syntypes: K, P].

= *Annona ambotay* AUBL. ssp. *occidentalis* R.E.FR., Ark. Bot., n.s., 1 (6): 345 (1950).

Type: Colombia, Valle del Cauca, Cordillera Occidental, vertiente occidental: Hoya del Río Digua, lado derecho, La Elsa, alt. 900 m, 5 Oct 1943 (fl), **J. Cuatrecasas 15265** [Holotype: S (photo: F); Isotypes: F (2 sheets), P, S, US].

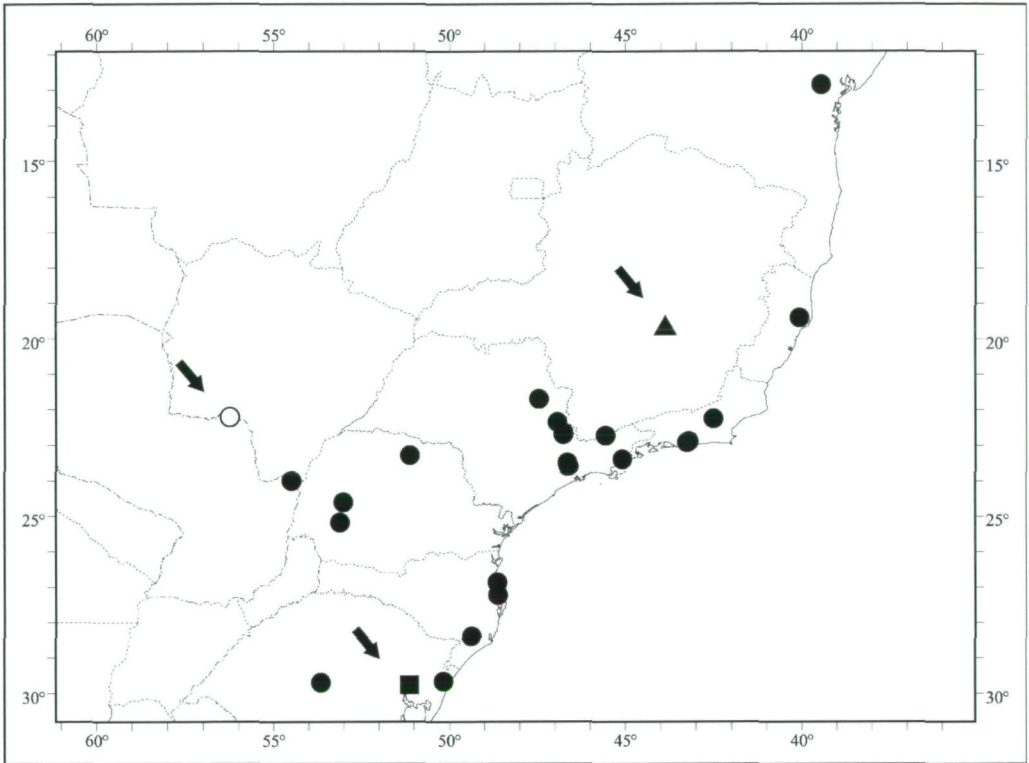


Fig. 2: Geographical distribution of *Annona cacans* WARM.; type location of *Annona cacans* ssp. *cacans* (▲), type location of *Annona cacans* ssp. *glabriuscula* (■), type location of *Annona amambayensis* (○), other localities (●).

= *Annona cherimolioides* TRIANA & PLANCH. var. *amplifolia* TRIANA & PLANCH., Ann. Sci. Nat. Bot., sér. 4., 17: 27 (1862).

Type: Colombia, Antioquia, Manizales, alt. 2400 m [!], s.d. (fl), **J. Triana s.n.** [Lectotype (selected here): P; Isolectotypes: BM (n.v.), K, S (n.v., fragm.), US]; – Colombia, Antioquia, [no further details!] s.d. (fl), **W. Purdie s.n.** [Syntypes: K, P] Note: The lectotype for *Annona cherimolioides* var. *amplifolia* (Triana s.n.) in the herbarium P has as altitude "2400 mts.", the isolectotypes from the herbaria K and US have "2140 mts.".

= *Raimondia monoica* SAFF., Contr. U. S. Natl. Herb. 16 (5): 217 - 219, pl. 52, 53 (1913). Type: Colombia, Cauca, Alto de Primicias, near Jambaló, Río Palo Basin, alt. 2600 m, 5 Feb 1906 (fl, fr), **H. Pittier 1456** [Holotype: US, 2 sheets (531655, 531656)].

Annona conica RUIZ & PAV. ex G.DON, Gen. hist. 1: 88 (1831).

≡ *Raimondia conica* (RUIZ & PAV. ex G.DON) WESTRA, in MAAS et al., Candollea 49 (2): 455 (1994).

Type: Ecuador, Guayas, Huayaquil [= Guayaquil], s.d. (fl), **H. Ruiz s.n.** [Holotype: B; Isotypes: BC (n.v.), F (n.v.), HAL (fragm.), OXF].

- = *Raimondia stenocarpa* R.E.FR., Ark. Bot., n.s., 4 (2): 24, t. 2 (1959).
 Type: Ecuador, Guayas, vicinity of Guayaquil, Cerro Azul, 14 Jun 1955 (fl, fr), **E. Asplund 16637** [Holotype: S (2 sheets); Isotypes: B (n.v.), NY (n.v.)].

***Annona deceptrix* (WESTRA) H.RAINER, comb.n.**

- = *Raimondia deceptrix* WESTRA, Bot. Jahrb. Syst. 117 (3): 287, 289, fig. 2 c, 3, 4 b, 5 (1995).

Type: Ecuador, Manabí, Parque Nacional Machalilla, sector San Sebastián, alt. 520 - 550 m, 12 Nov 1992 (fl, fr), **C. Josse et al. 890** [Holotype: AAU].

***Annona dioica* A.ST.-HIL., Fl. Bras. merid. 1 (1): 34 (1824).**

Type: Brazil, São Paulo, prés Sorocaba, campos, s.d. (fl), **A.F.C.P. de Saint-Hilaire s.n.** [Holotype: P (photos: F, MO); Isotypes: F (fragm.), P].

- = *Annona dioica* A.ST.-HIL. var. *mattogrossensis* R.E.FR., Acta Horti Berg. 10 (2): 221 (1931).

Type: Brazil, Mato Grosso, Cuyabá (= Cuiabá), 22 Nov 1893 (fl), **G.O.A. Malme I-1146** [Holotype: S, Isotypes: S, UPS].

Note: FRIES mentioned the type specimen as Malme II-1146, according to the label it must read Malme I-1146.

Annona dioica is one of the wide spread species occurring in savanna vegetation of the Central Brazilian plateaus following the Rio Paraguay southwards. Field observations in the state of Mato Grosso (Brazil), as well as detailed studies on numerous herbarium collections proved variability of the leaf shape, and as FRIES noted there are no differences in floral characters.

***Annona foetida* MART., Fl. bras. 13 (1): 16 (1841); fig. 3.**

Type: Brazil, Amazonas, prope Ega [= Tefé], Dec 1819 (fr), **C.F.P. von Martius s.n.** [Lectotype (selected here): M (photos: F, G, MO, NY, S); Isotypes: M (2 sheets)].

Note: In the Herbarium M are 3 sheets of *Annona foetida* collected by Martius, all of them belong obviously to the same collection. Only one has seeds in a separate capsule but no number on the label, this specimen is selected as the lectotype here, the other two specimens show "2914" and "2914 Obs." respectively on their labels but are sterile.

- = *Annona trunciflora* R.E.FR., Mem. New York Bot. Gard. 9 (3): 325 (1957).

Type: Venezuela, Bolívar, Río Parguaza, at Raudal Maracá (about 110 km. from mouth), alt. 115 m, 31 Dec 1955 (fl), **J.J. Wurdack & J.V. Monachino 41044** [Holotype: NY; Isotype: S (fragm.)].

One of the last descriptions made by FRIES based on the specimen of Wurdack & Monachino 41044 was pinpointed by its parallel leaf margin, no additional material has been mentioned. The leaf shape of *Annona foetida* is somewhat plastic and ranges from oblanceolate to elliptic, parallel margins are the exception but have been found in other specimens especially from the Guayana region as well. In the Flora of the Venezuelan Guayanas (RAINER 1995) this species was still mentioned as a distinct taxon.



Fig. 3: Lectotype of *Annona foetida* MART. (C.F.P. von Martius s.n. [M])

Annona hypoglauca MART., Fl. bras. 13 (1): 13 (1841).

Type: Brazil, Amazonas, along the Rio Solimões, Nov 1819 (fl), **C.F.P. von Martius s.n.** [Holotype: M (photos: F, G, MO, NY)].

= *Annona tessmannii* DIELS, Notizbl. Bot. Gart. Berlin-Dahlem 9: 140 (1924).

Type: Peru, Loreto, Stromgebiet des Rio Ucayali von 10° S bis zur Mündung, Amaqueria, am Rande des Sees (toten Armes), alt. 210 m, 24 Nov 1923 (fl), **G. Tessmann 3367** [Lectotype: B (photos: F, GH, MO, NY); Isolectotypes: F (fragm.), G, NY, S].

Annona tessmannii was described from a specimen collected in the Ucayali region of Peru. The main difference for distinguishing this taxon from *A. hypoglauca* was the shrubby vs. lianescent habit. In this group of *Annona*, incl. *A. cordifolia* (SZYSZYL.) R.E.FR., *A. macrocalyx* R.E.FR., and *A. scandens* DIELS, nonetheless a transition of shrubs, scandent shrubs towards canopy lianas can be observed regularly and refers to phenotypic plasticity. A geographic bias for a preference of shrubs in the upper courses of rivers vs. lianas in the main of the large Amazonian rivers could not be proved. FRIES (1931: 251) already mentioned the close relationship of both taxa: "steht der *A. hypoglauca* sehr nahe ...".

Annona jahnii SAFF., Contr. U. S. Natl. Herb. 18 (1): 36, fig. 44 - 45. pl. 19 (1914).

Type: Venezuela, Carabobo, Hacienda Solorzano, Borbarata Valley, SE of Puerto Cabello, 14 Jul 1913 (fr), **H. Pittier 6465** [Holotype: US (photo: US)].

= *Annona guaricensis* PITTIER, Bol. Minist. Relac. Exter. (Venezuela) 3: 76 (1927).

Type: Venezuela, Guárico, llanos de La Rubiera, 11 Apr 1927 (fl, fr), **H. Pittier 12318** [Holotype: VEN; Isotypes: G, M, NY, S (fragm.), US, VEN].

= *Annona ulei* R.E.FR., Acta Horti Berg. 10 (2): 243, t. 15 (1931).

Type: Brazil, Roraima, Rio Branco, bei Boa Vista, capão des campo, Oct 1908 (fl, fr), **E. Ule 7622** [Holotype: MG; Isotypes: B (2 sheets; photo: S), F, G (2 sheets), K, L].

FRIES (1931) had only one specimen at hand but as it had flowers and fruits he described *Annona ulei* as a new species. It was separated by somewhat more delicate and curved protuberances on the fruit surfaces, which in fact is in the variability of *A. jahnii*, there are no differences in leaf shape and consistency. The geographic gap from the savanna area of the Venezuelan Llanos to the Central Guayanan savannas of the state of Roraima (Brazil), was closed by more recent collections.

Annona macrophyllata DONN. SM., Bot. Gaz. (Crawfordsville) 49: 453 (1910).

Type: Guatemala, El Fiscal, elev. 3700 ft., 5 Jun 1909 (fl), **C.C. Deam 6191** [Holotype: US; Isotypes: GH, S (fragm.)].

= *Annona diversifolia* SAFF., Science n. s. 33 (847): 471 (1911).

Type: Mexico, Colima, Jul - Aug 1897 (fl, yfr), **E. Palmer 60** [Holotype: US (photos: BM, G, K); Isotype: C].

Not any morphological difference could be traced between the type specimens of both taxa: pronouncedly enlarged orbicular leafy pedicelar bracts, and a densely reddish hairy calyx are a unique and exceptional combination of characters for the genus

Annona. FRIES (1931: 293 - 294) separated both taxa by quantitative characters of the leaves and length of the pedicels, and indument of the bracts. This species is known only from cultivated plants, as is the case in *Annona muricata* L., *A. reticulata* L., and *A. squamosa* L.

***Annona monticola* MART.**, Fl. bras. 13 (1): 7 - 8 (1841).

Type: Brazil, Minas Gerais, prope Tejuco (= Diamantina), May 1818 (fl), **C.F.P. von Martius s.n.** [Holotype: M (photos: F, G, MO, NY)].

= *Annona monticola* MART. var. *brevipetiolata* R.E.FR., Acta Horti Berg. 10 (2): 214 (1931).

Type: Brazil, Mato Grosso, Santa Ana da Chapada, in campis apertis v. in cerrados minus densis, 11 Oct 1902 (fl), **G.O.A. Malme II s.n.** [Holotype: S].

This variety was only based on the short petioles, which proved to be within the range of variability.

***Annona neglecta* R.E.FR.**, Acta Horti Berg. 12 (2): 278 (1937).

Type: Peru, Junín, ad Vitoc, 1794 (fl), **H. Ruiz s.n.** [Holotype: B (photos: F, GH, MO, NY, S); Isotypes: F, G, HAL, MA (2 sheets), S (fragm.)].

= *Annona oligocarpa* R.E.FR., Kongl. Svenska Vetenskapsakad. Handl., ser. 3, 24 (10): 17, pl. 7 c - e (1948).

Type: Ecuador, Guayas, east of Manglar Alto, alt. 100 m, wet forest, 25 Jun 1941 (fl), **O. Haught 3101** [Holotype: S (photo: S); Isotypes: F, MO (n.v.), US].

These two taxa have been described by FRIES from the Ecuadorian and Peruvian part of the Andes. Their geographic distribution pattern is one of the rare cases in Annonaceae where species reach higher altitudes and occur on both sides of the Andes. Morphological details (length of the flower pedicel) and geographic separation were the reasons for keeping them separate. The peculiar pattern with cuticular foldings on the abaxial side of the leaves, visible as small pockets already at low magnification with a hand lens (10 ×), together with floral (small and connate petals, outer petals baccate) and fruit characters (few seeded, red at maturity) are unique in the genus. In CHATROU et al. (1997) *Annona oligocarpa* R.E.FR. was still mentioned as a distinct taxon.

***Annona quinduensis* KUNTH, in HUMB., BONPL. & KUNTH**, Nov. Gen. Sp. 5: 60 (1821).

≡ *Raimondia quinduensis* (KUNTH) SAFF., Contr. U.S. Natl. Herb. 18 (1): 62, fig. 72, pl. 40 (1914).

Type: Colombia, crescit in Andibus Quinduensibus ("Provincia Novo-Granatensi"), alt. 1200 hex., s.d. (fl), **A. von Humboldt & A. Bonpland 1856** [Holotype: P-Bonpl. (photos: F, MO); Isotypes: B-Willd. (14023), F (fragm., n.v.), P].

= *Raimondia quinduensis* (KUNTH) SAFF. var. *latifolia* R.E.FR., Acta Horti Berg. 10 (1): 84 (1930).

Type: Colombia, Cundinamarca ("Prov. de Tequendama"), Copó, Quebrada grande, alt. 1000 m, May 1855 (fl, fr), **J. Triana s.n.** [Holotype: P; Isotypes: COL (n.v.), G, K (2 sheets), US].

Annona rosei SAFF., Contr. U. S. Natl. Herb. 18 (1): 56, fig. 66. pl. 35 - 37 (1914).

Type: Dominican Republic, Azua, Mar 1903 (fl, yfr), **J.N. Rose et al. 4038** [Holotype: US (photos: BH, G, MO n.v.); Isotypes: A, B, BH, C, F, G, GH (2 sheets), K, MO (n.v.), P (2 sheets), US].

= *Annona domingensis* R.E.FR., Acta Horti Berg. 10 (2): 308, tab. 24 (1931).

Type: Dominican Republic, llano costero, Santo Domingo City, near Castillo de San Jerónimo, roadsides, 18 May 1929 (fl), **E.L. Ekman H12550** [Holotype: S (n.v.); Isotypes: B (n.v., destroyed), K, NY].

= *Annona dumetorum* R.E.FR., Acta Horti Berg. 10 (2): 308 - 309, tab. 25 (1931).

Type: Dominican Republic, llano costero, Santo Domingo City, at Rio Ozama, in thickets, common, 30 Apr 1929 (fl), **E.L. Ekman H12351** [Holotype: S (n.v.); Isotypes: A, B, C, F, G, K, MO (n.v.), NY, U].

This is one of the rare cases, that FRIES did not interpret collections correctly. He kept these species separate again on the shape of the leaves, fruits were missing then. Recent collections by P.J.M. Maas, T. Zanoni, and others brought to light the variability of the leaf shape which on one and the same plant change from narrowly oblanceolate and apically acute to (narrowly) obovate and rounded. Flowers and fruits show great resemblance.

Annona salzmännii A.DC., Mém. Soc. Phys. Genève 5: 197 (1832).

Type: Brazil, Bahia, [no further details!], 1830 (fl), **P. Salzmann 5** [Holotype: G-DC (photo: BM); Isotypes: B (fragm.), HAL, P].

= *Annona impressivenia* SAFF. ex R.E.FR., Acta Horti Berg. 10 (2): 223 (1931).

Type: Brazil, Rio de Janeiro, s.d. (fl), **A.F.M. Glaziou 17464** [Holotype: B (photos: F, MO, S); Isotypes: C, K, P].

Note: This taxon is of uncertain provenance. As already noted by WURDACK (1970) collections of Glaziou have been acquired from various sources and often wrongly labeled. The area of Rio de Janeiro as provenance for this specimens is highly improbable, in addition there is not a single recent collection from the state of Rio de Janeiro.

Leaves of the type specimen of *Annona impressivenia* are narrowly obovate to oblanceolate and have a short tip. Leaves of *A. salzmännii* especially in the type are obovate but emarginate, flowers are essentially the same with a characteristic cup-shaped and sometimes irregularly rupturing calyx.

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