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Notes on the taxonomy and distribution of the *Ochnaceae* in the Greater Antilles

Abstract

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In the Greater Antilles the family *Ochnaceae* is represented by the genera *Sauvagesia* and *Ouratea*. The genus *Sauvagesia* is represented by *S. tenella* in Cuba and Hispaniola, *S. erecta* subsp. *erecta* in Hispaniola and Puerto Rico and *S. erecta* subsp. *brownei* in Cuba and Jamaica. The genus *Ouratea* comprises: *O. agrophylla*, *O. revoluta*, *O. elliptica*, *O. schizostyla*, *O. xolismifolia*, *O. xacunae* and *O. xsavannarum*, all endemic to Cuba; *O. striata* from Cuba and Puerto Rico; *O. nitida* from Cuba and Jamaica; *O. litoralis*, endemic to Puerto Rico; *O. ilicifolia*, endemic to Hispaniola; and *O. laurifolia*, *O. jamaicensis* and *O. elegans*, all endemic to Jamaica. Identification keys to the genera and species are presented.

Key words: plant systematics, Caribbean, biogeography, endemism, identification keys.

Introduction

The family *Ochnaceae* DC., with 26 genera, is widespread in the tropics and subtropics (Brummitt 1992). In the Greater Antilles it is represented by the two genera *Sauvagesia* L. and *Ouratea* Aubl. The following regional floras are available: Cuba (Alain 1953), La Española [= Hispaniola] (Alain 1985), Puerto Rico (Alain 1994) and Jamaica (Fawcett & Rendle 1926, Adams 1972). More details about the species can be found in the monographs by Dwyer (1945) and Sastre (1971a-b). The present study is based on examination of specimens from the following herbaria: B, BM, BREM, F, G, GH, GOET, HAC, HAJB, IJ, JE, K, MA, MAPR, NY, S, UPRRP, US (abbreviations after Holmgren & al. 1990) and on field work in Cuba and Puerto Rico.

Ochnaceae DC. in Nouv. Bull. Sci. Soc. Philom. Paris 2: 208. 1811.

Trees, shrubs and herbs. Stipules entire or pectinate. *Leaves* simple, alternate, short-petiolate; leaf blade variously shaped; leaf margin entire, crenate, serrate, serrulate, denticulate or spiny-dentate, revolute or plane; venation pinnate; surface glabrous. *Inflorescences* terminal or axillary, racemose, panicles in pairs or solitary. *Flowers* pedicellate, actinomorphic, bisexual. *Calyx* with 5 or 10 free, papyraceous sepals, persistent or not in fruit. *Corolla* with 5 free, membranaceous petals.

Stamens 5-10, free, hypogynous, with short filaments; anthers long, 2-locular, basifixed, opening by pores or slits; staminodes in 2 or 3 series (the crown) surrounding the stamens, filament-like or petaloid, stamens and staminodes persistent or not in fruit. *Ovary* superior, with 2-5 or more carpels, borne usually on an elongated toral disc (torus) or gynophore, each carpel with 2-5 locules, ovules 1-many per locule, erect or rarely pendulous; style usually one, simple; stigmas 1-5. *Fruit* with mature carpidia separating into distinct, fleshy drupes, on the surface of the elongate receptacle (torus), often coloured, rarely a capsule; seeds with or without endosperm; embryo usually straight.

Distribution. – Tropics and subtropics; especially abundant in northeastern South America. The family has a limited economic importance. Some species of *Ochna* are cultivated as ornamentals (Lawrence 1966). *Sauvagesia erecta* is used for tea in the Lesser Antilles and *Ouratea parviflora* provides valuable edible oil from the fruits (Hanelt 2001).

Key for the genera of the *Ochnaceae* in the Greater Antilles

1. Herbs or prostrate, dwarf shrubs; stipules pectinate, persistent; flowers small, solitary or in pairs, white or pale pink; stamens 5, with two types of staminodes in two or three series; fruit a capsule 1. *Sauvagesia* L.
- Erect shrubs or trees; stipules entire, deciduous; flowers in showy racemes, bright yellow; stamens 10, without staminodes; fruits drupaceous, borne on a fleshy, coloured receptacle (torus) 2. *Ouratea* Aubl.

1. *Sauvagesia* L., Sp. Pl.: 203. 1753.

Type species: *Sauvagesia erecta* L.

Herbs or dwarf shrubs. *Stipules* pectinate, with up to 10 pairs of cilia, persistent. *Leaf blade* lanceolate; leaf margin crenate, enlarged; venation prominent, pinnate. *Flowers* in pairs or solitary. *Calyx* quincuncial, persistent and closing the fruit. *Corolla* white. *Stamens* 5, anthers opening by slits; staminodes in 2-3 series, petaloid or/and filiform, stamens and staminodes persistent in the fruit. *Ovary* 3-locular, style and stigma simple. *Fruit* a capsule, surrounded by the calyx, stamens and staminodes; seeds many, very small.

Distribution. – A pantropical genus with 39 species (Mabberley 1997).

Key to the species of *Sauvagesia* in the Greater Antilles

1. Herbs without ramification, simple, to 10 cm high; leaf blade 3-8 mm long; pedicels c. 5 mm long 1.1. *S. tenella*
- Prostrate, dwarf shrubs, sometimes ramified, to 40(-70) cm high; leaf blade c. 20 mm long; pedicels c. 20 mm long 1.2. (*S. erecta*) 2
2. Leaf margin dentate; inner staminodes 5, petaloid, forming a tube 1.2.1. *S. erecta* subsp. *erecta*
- Leaf margin crenulate; inner staminodes 0 or 5, scale- or tongue-shaped (ligulate), not forming a tube 1.2.2. *S. erecta* subsp. *brownei*

1.1. *Sauvagesia tenella* Lam., Tabl. Encycl. 2: 119. 1797.

Holotype: [Guyane Française] paludosis Cayenna, *Richard* (P-LA photo!; isotypes: C!, G!, L!, P-JU photo!).

Distribution. – Hispaniola and Cuba, in savannas; 0-60 m; very rare; Central America and tropical South America.

Note. – *Wright 2131* from Cuba, published as *Sauvagesia pulchella* Planch. (Grisebach 1866), represents actually *S. tenella*. *S. pulchella* is not present in the Greater Antilles.

1.2. *Sauvagesia erecta* L., Sp. Pl.: 203. 1753.

Lectotype (designated by Whitefoord in Regum Veg. 127: 85. 1993): Domingo [Santo Domingo, Hispaniola] (LINN 283.2 photo!)

1.2.1. *Sauvagesia erecta* subsp. *erecta*

Distribution. – Hispaniola and Puerto Rico, widespread in savannas, thickets and forests; 0-1100 m; common; pantropical.

Illustration. – Alain (1985: 262).

Note. – A specimen of *S. erecta* subsp. *erecta* said to be from Cuba collected by de la Ossa (P!) probably originates from another island (Sastre 1971a). This taxon has never been found in Cuba again.

1.2.2. *Sauvagesia erecta* subsp. *brownei* (Planch.) Sastre in Caldasia 11(51): 21. 1971

≡ *Sauvagesia brownei* Planch. in Linden & Planchon, Pl. Columb.: 64. 1874-75 [“1863”]. – Lectotype (designated here): [icon] Iron 1. P. Browne, Civ. Nat. Hist. Jamaica, t. 12, f. 3. 1756 . = *Sauvagesia microphylla* Urb. in Repert. Spec. Nov. Regni Veg. 22: 39. 1925. – Holotype: Cuba, Prov. Pinar del Río, San Juan y Martínez, Río San Sebastián, 14.11.1923, *Ekman 18056* (S!; isotype: G!).

= *Sauvagesia stenophylla* Urb. in Repert. Spec. Nov. Regni Veg. 22: 39. 1925. – Holotype: Cuba, Isla de Pinos, Santa Bárbara, 3.11.1920, *Ekman 12075* (S!).

Distribution. – Cuba and Jamaica, widespread in savannas, thickets and forests; 50-175 m; common.

Illustration. – Fawcett & Rendle (1926: 177).

2. *Ouratea* Aubl., Hist. Pl. Guiane: 397. 1775, nom. cons.

Type species: *Ouratea guianensis* Aubl.

Shrubs or trees. Stipules entire, deciduous. *Leaf* blade elliptic, obovate, oblong or lanceolate, apex acuminate, acute, rounded or obtuse, base acute or cuneate; leaf margin entire, serrate, serrulate or spiny-dentate; venation prominent, pinnate, with arcuate, ascending secondary veins becoming parallel to the leaf margin; revolute or plane. *Inflorescences* in terminal or axillary panicles or racemes. *Flowers* big, showy. *Calyx* with 5 sepals, imbricate, not persistent. *Corolla* with 5 petals, imbricate in the bud, bright yellow. *Stamens* 10, anthers opening by apical pores, without staminodes. *Ovary* 5-carpelled, born on a torus or gynophore; style simple, central, less frequently 5 free styles; stigmas 5. *Fruit* drupaceous, each mature carpel separate on a fleshy drupe coloured bright blue or black, each drupe borne on an enlarged torus which becomes fleshy and red-coloured.

Distribution. – A pantropical genus with 150 species (Mabberley 1997).

Key to the species of *Ouratea* in the Greater Antilles

1. Leaf margin entire 2
- Leaf margin serrate, serrulate, or spiny-dentate 9
2. Leaf blade up to 3 cm long; margin strongly revolute; inflorescences few-flowered (3-4 flowers) 2.1. *O. xolismifolia*
- Leaf blade over 3 cm long; margin revolute or plane; inflorescences many-flowered 3
3. Leaf blade elliptic, obovate; apex acute to rounded, sometimes emarginated; margin revolute or plane 4
- Leaf blade oblong, elliptic or ovate; apex acute to acuminate; margin plane 6
4. Leaf blade up to 5 cm long, margin revolute 2.2. *O. revoluta*

- Leaf blade up to c. 10 cm long; margin plane 5
- 5. Leaf blade c. 6 cm long, coriaceous; apex acute or obtuse; third order veins not visible; styles single, simple 2.3. *O. elliptica*
- Leaf blade c. 9 cm long, chartaceous; apex acute; third order veins visible; styles 5, free 2.4. *O. schizostyla*
- 6. Leaf blade elliptic; apex long-acuminate; base acute 2.5. *O. elegans*
- Leaf blade elliptic, ovate, oblong; apex not acuminate; base cuneate 7
- 7. Leaf blade oblong, c. 11 × 4 cm; drupes 12 mm long 2.6. *O. jamaicensis*
- Leaf blade elliptic or ovate, c. 8 × 3 cm; drupes 8 mm long 8
- 8. Leaf blade elliptic, c. 6 × 2 cm; inflorescences lax, pyramidal 2.7. *O. striata*
- Leaf blade ovate, c. 8 × 3 cm; inflorescences compact, rounded 2.8. *O. laurifolia*
- 9. Leaf margin minutely serrulate, principally towards the apex 2.9. *O. litoralis*
- Leaf margin serrate or spiny-dentate 10
- 10. Leaf margin serrate; apex acuminate, base rounded; drupes spherical 2.10. *O. nitida*
- Leaf margin spiny-dentate; apex acute or rounded; drupes ovoid 11
- 11. Leaf margin with 8 mm long, spiny teeth; blade c. 7.5 cm long 2.11. *O. agrophylla*
- Leaf margin with up to 4 mm long, spiny teeth; blade 9-15 cm long 12
- 12. Leaf blade c. 15 × 3.5-4 cm 2.12. *O. ilicifolia*
- Leaf blade c. 9-10 × 2.5-3 cm 13
- 13. Leaf margin with 2-3 mm long, spiny teeth; blade c. 10 cm long; apex acute 2.13. *O. xsavannarum*
- Leaf margin with 1 mm long, spiny teeth; blade c. 9 cm long; apex rounded to obtuse. 2.14. *O. xacunae*

2.1. *Ouratea xolismifolia* Britton & P. Wilson in Bull. Torrey Bot. Club 50: 42. 1923.

Holotype: Cuba: [Province Granma] Southern Oriente and Pico Turquino, High Maestra, 7.1922, León 10911 (NY 84241!; isotype: HAC!).

Distribution. – Cuba, in cloud forests; about 1000 m; very rare.

2.2. *Ouratea revoluta* (C. Wright ex Griseb.) Engl. in Martius, Fl. Bras. 12(2): 346. 1876

≡ *Gomphia revoluta* C. Wright ex Griseb. in Mem. Amer. Acad. Arts, ser. 2, 8: 166. 1860. – Holotype: Cuba: [Province Guantánamo] prope villam Monte Verde, 6.-7.1859, Wright 1128 (GOET!; isotypes(?): BM!, G!, GH!, F!, K!, S! [2×], US!).

Distribution. – Cuba, in rainforests and thickets; 100-1000 m.

2.3. *Ouratea elliptica* (A. Rich.) M. Gómez, Dicc. Bot. 56. 1889

≡ *Gomphia elliptica* A. Rich. in Sagra, Hist. Phys. Cuba, Bot. Pl. Vasc.: 340-341. 1846 ≡ *Campouratea elliptica* (A. Rich.) Tiegh. in Ann. Sci. Nat., Bot. sér. 8, 16: 214. 1902. – Holotype: Cuba: Ramón de la Sagra, ex herb. Richard (P photo!; isotype: P photo!).

= *Gomphia pinetorum* C. Wright ex Griseb., Cat. Pl. Cub.: 37. 1866. ≡ *Ouratea pinetorum* (C. Wright ex Griseb.) Tiegh. in Ann. Sci. Nat., Bot. sér. 8, 16: 257. 1902. – Holotype: Cuba occ. [Province Pinar del Río], in pinetis, Bahía Honda, 1860-64, Wright 2116 (GOET [n.v.]).

= *Gomphia alaternifolia* (A. Rich.) Engl. in Martius, Fl. Bras. 12(2): 339. 1876 [“*alaternifolia*”] ≡ *Ouratea alaternifolia* A. Rich. in Sagra, Hist. Phys. Cuba, Bot. Pl. Vasc.: 339. 1846. – Holotype: Cuba, Ramón de La Sagra, ex herb. Richard (P photo!).

Distribution. – Cuba, in pine forests and savannas; 100-720 m; very common.

Illustration. – Alain (1953: 297).

2.4. *Ouratea schizostyla* Berazaín in Willdenowia 33: 183. 2003.

Holotype: Cuba, Isla de Pinos [Isla de la Juventud], pinar húmedo al pie norte del Cerro Mal País, 3.1967, *Bisse HFC 1634* (JE!; isotype: B!).

Distribution. – Cuba, in savannas; about 100 m; very rare.

Illustration. – Berazaín (2003: 184, 185).

2.5. *Ouratea elegans* Urb., Symb. Antill. 5: 428. 1908.

Holotype: Jamaica, Westmoreland prope Beaufort in Woodstock, 430 m, 20.9.1897, *Harris 9912* (B†; isotypes: BM!, K!, NY 84235!, US!).

Distribution. – Jamaica, in forests; about 300 m; very rare.

2.6. *Ouratea jamaicensis* (Planch.) Urb., Symb. Antill. 1: 362. 1899

≡ *Gomphia jamaicensis* Planch. in London J. Bot. 6: 11. 1847. – Holotype: Jamaica, *Mac Fadyen* in herb. Hook. (K? [n.v.]).

Distribution. – Jamaica, in forests, about 800 m; common.

2.7. *Ouratea striata* (Tiegh.) Urb., Symb. Antill. 5: 427. 1908

≡ *Campouratea striata* Tiegh. in Ann. Sci. Nat., Bot. sér. 8, 16: 214 [nom. nud.], 217. 1902. – Lectotype (designated here): Cuba [Provincia Guantánamo] prope villam Monte Verde dictam Cuba orientali, 1.7.1859, *Wright 58* (P photo!; isotypes (?): B†, BM!, GH!, HAC!, K!, NY 84242!, NY 622184!, S!).

= *Ouratea affinis* Britton in Mem. Torrey Bot. Club 16: 82. 1920. – Holotype: Cuba: Río Naranjo, ad 450-550 m, mountains of northern Oriente, 8.2.1910, *Shafer 3869* (NY 84232!).

= *Ouratea roigii* Britton in Mem. Torrey Bot. Club 16: 82. 1920. – Holotype: Cuba, Cañete, Baracoa, Oriente, 31.8.1917, *Roig 67* (NY 84239!; isotype: HAC!).

Distribution. – Puerto Rico and Cuba, in forests and thickets; 100-1000 m; very common.

2.8. *Ouratea laurifolia* (Sw.) Engl. in Martius, Fl. Bras. 12 (2): 350. 1876

≡ *Gomphia laurifolia* Sw., Fl. Ind. Occ. 2: 741. 1798 ≡ *Ochna laurifolia* Kuntze, Revis. Gen. Pl. 1: 106. 1891. – Holotype: Jamaica, *Swartz* (BM? [n.v.]).

Distribution. – Jamaica, in forests; 300-900 m; common.

Illustration. – Fawcett & Rendle (1926: 175).

Note. – Erroneously cited for Cuba (Dwyer 1944, Alain 1953).

2.9. *Ouratea litoralis* Urb., Symb. Antill. 1: 363. 1899.

Lectotype (designated here): Portorico prope Bayamon, in fruticetis et ruderalis, *Stahl 466* (S!).

Distribution. – Puerto Rico, in dry thickets and dry forests; 0-300 m; common.

Illustration. – Alain (1994: 212).

Note. – Urban (1899: 363) gave the number of this collection as “446”. This is a mistake, because on the original label with the word “typus” in Urban’s handwriting the number is “466”.

2.10. *Ouratea nitida* (Sw.) Engl. in Martius, Fl. Bras. 12 (2): 310. 1876

≡ *Ochna nitida* Sw., Prod.: 67. 1788 ≡ *Gomphia nitida* (Sw.) Vahl, Symb. Bot. 2: 49. 1791 ≡ *Trichouratea nitida* (Sw.) Tiegh. in Ann. Sci. Nat., Bot., sér. 8, 16: 235. 1902. – Holotype: Jamaica, 1789, *Swartz* (BM!).

= *Ouratea cubensis* Urb., Symb. Antill. 1: 362. 1899. – Lectotype (designated here): Cuba, Province of Santa Clara, District of Cienfuegos, Cieneguita, 27.6.1885, *Combs 171* (NY!; isolectotypes: F!, G!, P photo!).

Distribution. – Jamaica and Cuba, in savannas and forests, common in Cuba; 0-1020 m; in Jamaica only known from the type collection; Central America and northern South America.

Note. – The Brazilian species *Gomphia acuminata* DC. is erroneously cited for Cuba (Richard 1841-51); it is not synonymous with *O. nitida* (Grisebach 1866, Dwyer 1944, Alain 1953).

2.11. *Ouratea agrophylla* (Tiegh.) Urb., Symb. Antill. 5: 426. 1908

≡ *Camptouratea agrophylla* Tiegh. in Ann. Sci. Nat., Bot., sér. 8, 16: 215. 1902. – Lectotype (designated here): Cuba, Province of Santa Clara, District of Cienfuegos, [Province Cienfuegos] Calicita 11 K, 14.6.1895, *Combs 249* (P photo!; isolectotypes: NY!, F [2×!]).

Distribution. – Cuba, dry thickets; 20-300 m; common.

2.12. *Ouratea ilicifolia* (DC.) Baill., Hist. Pl. 4: 366. 1873

≡ *Gomphia ilicifolia* DC. in Ann. Mus. Hist. Nat. 17: 418. 1811. – Holotype: St. Domingue, *Delporte* (P-JU photo!).

= *Ouratea spinulosa* Urb., Symb. Antill. 1: 362. 1899. – Holotype: Haiti, ad petite rivièrè de l'Antibonite in savannis, m. April fruct., *Picarda 1579* (B†).

= *Ouratea jaegeriana* Urb., Symb. Antill. 5: 425. 1908. – Holotype: Haiti, in montibus sylvaticis ad vicum St. Michel 160 m alt. et inter urbam Miraguane et les cayes, *Jaeger 237* (B†).

= *Ouratea lenticellosa* Urb. in Repert. Spec. Nov. Regni Veg. 18: 366. 1922. – Holotype: Santo Domingo, in terra australis sinus Samanaensis insulae S. Gabriel opposite prope San Lorenzo ad occidentem versus alt. maris, 5.1.1921, *Abbott 1242* (B †; isotypes: NY!, US!).

Distribution. – Hispaniola (Haiti and Santo Domingo), in dry thickets and forests; about 400 m; common.

Note. – Erroneously cited for Puerto Rico (Dwyer 1944, Alain 1994) and Cuba (Dwyer 1944, Alain 1953).

Illustration. – Alain (1994: 260).

2.13. *Ouratea x savannarum* Britton & P. Wilson in Bull. Torrey Bot. Club 48: 342. 1921 (pro sp.) [*Ouratea agrophylla* (Tiegh.) Urb. × *Ouratea nitida* (Sw.) Engl.].

Holotype: Cuba, Sabana de San Marcos, 22.7.1920, *Léon 9205* (NY 84240!).

Distribution. – Cuba, in savannas; 0-70 m; not common.

2.14. *Ouratea x acunae* Borhidi in Acta Bot. Hung. 25: 47. 1979 [*Ouratea elliptica* (A. Rich.) M. Gómez × *Ouratea ilicifolia* (DC.) Baill.].

Holotype: Cuba, Pinar del Río, carretera de Luis Lazo, *Acuña 16007* (HAC!).

Distribution. – Cuba, in savannas; 300-400 m; rare.

Floristic relationships and endemism

In the Greater Antilles *Ochnaceae* has a high level of endemism: in the genus *Sauvagesia* about 33 %, in the genus *Ouratea* about 93 %. The major concentration of taxa is in Cuba with 61 %, followed by Jamaica with 29 % and Hispaniola and Puerto Rico with 5 % each.

The major floristic relationship is between Cuba and Jamaica with two taxa in common. The pairs Cuba and Hispaniola, Cuba and Puerto Rico and Hispaniola and Puerto Rico share one

taxon each. No taxa are shared between Jamaica and Hispaniola and between Jamaica and Puerto Rico.

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