

TYPIFICATION AND NOMENCLATURE OF FIVE TAXA ENDEMIC TO JAMAICA

TRACY COMMCK, ^{1,2,3} PHILIP E. ROSE, ² KANCHI N. GANDHI, ⁴ KERON C. ST. E. CAMPBELL, ^{1,2}
KENNETH J. WURDACK, ⁵ JAVIER FRANCISCO-ORTEGA, ^{6,7} AND BRETT JESTROW ⁷

Abstract. Recent systematic treatments for Jamaica have shown that the island is home to seven endemic genera of seed-plants [viz., *Dendrocousinsia* (Euphorbiaceae), *Jacmaia* (Asteraceae), *Odontocline* (Asteraceae), *Portlandia* (Rubiaceae), *Salpixinantha* (Acanthaceae), *Tetrasiphon* (Celastraceae), and *Zemisia* (Asteraceae)]. These taxa account for over 23 species, with three genera (*Jacmaia*, *Tetrasiphon*, and *Zemisia*) being monotypic. Further study of these taxa revealed that five names need typification: (1) *Tetrasiphon jamaicensis* Urb.; (2) *Senecio fadyenii* Griseb.; (3) *S. fadyenii* var. *dolichanthus* Krug & Urb.; (4) *S. hollickii* Britton ex Greenm. [all the three *Senecio* taxa included in *Odontocline*]; and (5) *Gymnanthes elliptica* Sw. Lectotypes for these names are designated here. Furthermore, *G. elliptica* is transferred to *Dendrocousinsia* and the new combination is made here: *D. elliptica* (Sw.) Commock & K. Wurdack.

Keywords: Caribbean Islands, tropical islands, nomenclature, taxonomy, systematics

The Caribbean Island Biodiversity Hotspot has about 180 endemic genera of seed-plants, including seven restricted to Jamaica [i.e., *Dendrocousinsia* Millsp. (Euphorbiaceae), *Jacmaia* B. Nord. (Asteraceae), *Odontocline* B. Nord. (Asteraceae), *Portlandia* P. Browne (Rubiaceae), *Salpixinantha* Hook. (Acanthaceae), *Tetrasiphon* Urb. (Celastraceae), and *Zemisia* B. Nord. (Asteraceae)]. These seven genera contain over 23 species (Francisco-Ortega et al., 2007, 2008; Acevedo-Rodríguez & Strong, 2012; Herrera Oliver & González Gutiérrez, 2013).

The plant genera restricted to Jamaica received significant attention by Bretting (1983 a, b), who provided brief descriptions, photographs, illustrations, and distribution reviews for each genus. His work represented the first comprehensive summary for important components of the flora of this island. As part of her Ph.D. research at the University of the West Indies, Commock will present an update of Bretting's (1983 a, b) studies that will include a review of the taxonomic treatments, nomenclature, and typification of these genera. The latest comprehensive floristic treatments for Jamaica were published by Adams (1972) and by Proctor (1982), but they did not address the nomenclature and typification of names associated with these endemic genera.

The research conducted so far has revealed that types have not been assigned or have not been clearly discussed for five names that are currently associated with the endemic genera *Dendrocousinsia* (*Gymnanthes elliptica* Sw.), *Tetrasiphon* (*T. jamaicensis* Urb.), and *Odontocline*

(*Senecio fadyenii* Griseb., *S. fadyenii* var. *dolichanthus* Krug & Urb., and *S. hollickii* Britton ex Greenm.). Furthermore, *G. elliptica* has not been taxonomically accommodated into *Dendrocousinsia*. In this study, we formally transfer *G. elliptica* to *Dendrocousinsia* and make the new combination *D. elliptica* (Sw.) Commock & K. Wurdack.

The authors have reviewed the literature and examined herbarium specimens; following the International Code of Nomenclature (ICN) for algae, fungi, and plants (McNeill et al., 2012), we herewith present five typifications, nomenclature treatments, and one new combination here. The herbaria consulted for this research include BM, J, K, UCWI and US. Digital images were reviewed for relevant collections at B, GOET, NY, P, and S. These electronic images were either sent to us by special requests or remotely accessed from the internet.

The five names that are the subject of this study are arranged alphabetically by the endemic genus wherein they are currently placed. This is followed by a brief discussion justifying the typifications and providing relevant taxonomic and systematics information.

1. *Dendrocousinsia elliptica* (Sw.) Commock & K. Wurdack, **comb. nov.** = *Gymnanthes elliptica* Sw., Prodr.: 96. 1788. = *Sebastiania elliptica* (Sw.) Müll. Arg., Prodr. 15(2): 1181. 1866. = *Ateramnus ellipticus* (Sw.) Rothm., Feddes Repert. Spec. Fl. Ind. Regni Veg. 53: 5. 1944. = *Excoecaria tinifolia* Sw., Fl. Nov. Occid. 2: 1119. 1800, nom. superfl. & illeg. = *Gymnanthes obtusa* Baill., Étude Euphorb.: 530. 1858, *nom. inval.*

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¹ Natural History Museum of Jamaica, Institute of Jamaica, Kingston, Jamaica

² Department of Life Sciences, University of the West Indies, Mona Campus, Kingston, Jamaica

³ Corresponding author: tcommock@nhmj-ioj.org.jm

⁴ Harvard University Herbaria, 22 Divinity Avenue, Cambridge, Massachusetts 02138, U.S.A.

⁵ Department of Botany, National Museum of Natural History, Smithsonian Institution, P.O. Box 37012, Washington DC 20013, U.S.A.

⁶ International Center for Tropical Botany, Kimberly Green Latin American and Caribbean Center, Cuban Research Institute, Department of Biological Sciences, Florida International University, Miami, Florida 33199, U.S.A.

⁷ Fairchild Tropical Botanic Garden, Coral Gables, Florida 33156, U.S.A.

Described from: “Jamaica”

Lectotype (designated here): “a celeb. D. Doct. Ol. Swartz,” *O. Swartz s.n.* (S11-341); isolectotypes: G-DC, BM? BR?

Molecular phylogenetic research coupled with morphological studies clearly supports that the Jamaican endemic *Gymnanthes elliptica* should be transferred to *Dendrocousinsia* (Commock et al., in prep.; Wurdack, in prep.). A new combination to accommodate *G. elliptica* in *Dendrocousinsia* is needed, and it is presented here. Additional molecular systematic studies have also shown that *Gymnanthes* (~ 45 spp.), as currently circumscribed (Esser, 2001), is polyphyletic (Wurdack, in prep.).

Gymnanthes, as originally proposed, consisted of two species, viz., *G. elliptica* and *G. lucida*, and of these two names, *G. elliptica* was the first cited species in sequence (Swartz, 1788). Prior to the 2017 International Botanical Congress (held in Shenzhen, China), it was generally accepted that the type species of *Gymnanthes* was *G. elliptica* [as designated by Britton & Shafer (1908: 600)]. As far as we are aware, no taxonomic treatment has assigned *G. elliptica* as the type species for *Gymnanthes* prior to Britton & Shafer (1908: 600); their typification, however, could be considered as largely mechanical as elaborated below (also see ICN Art. 10 Ex. 7).

In the July 2017 Shenzhen congress, the Nomenclature Session approved a set of proposals from John McNeill et al. (2016) pertaining to generic typifications made by Britton and his associates (Turland & Wiersema, 2017: 234). Two of the accepted proposals are quoted here: (1) “A type selection made under a largely mechanical method is superseded by any later choice of a different type not made under that method, unless, in the interval, the supersedable choice has been affirmed in a publication that did not use a mechanical method of selection.” and (2) “The following criteria determine whether a particular publication, appearing prior to 1 January 1935, has adopted a largely mechanical method of type selection: (a) any statement to that effect, including that the American Code or the “Philadelphia Code” was being followed or that types were determined in a particular mechanical way (e.g. the first species in order)... (e) if an author of the publication was an employee or a recognized associate of the New York Botanical Garden; or (f) if an author of the publication was an employee of the United States government.”

It has been a known fact that Britton and Shafer were employees of the New York Botanical Garden and that they practiced the then existed American Code, which advocated to choose the first species in order as the type for a genus name. This pattern of type selection is evident throughout Britton & Shafer’s (1908) North American trees adding weight to our specific contention that their choice of *Gymnanthes elliptica* as the genus name type (Britton & Shafer, 1908: 600) was made under the mechanical method of the American Code and that *G. elliptica* cannot be the type species for *Gymnanthes*. Moreover, Webster (1967: 388) assigned the widespread Neotropical *G. lucida* Sw. as the type for *Gymnanthes*. From what we have found,

prior to Webster’s contribution, no taxonomic treatment had assigned *G. elliptica* or *G. lucida* as the type species for *Gymnanthes*, with the exception of the aforementioned publication by Britton & Shafer (1908).

Some works including those by Webster himself (Webster, 1967: 388, 1994: 122) considered Grisebach (1859: 50) as the type species designator for *Gymnanthes*, indeed it seems that Webster (1967: 388) was not aware that he was typifying this genus as in his work he stated: “Lectotype species: *G. lucida* Sw.; typification effected by Grisebach, Fl. Brit. W. Indian Is. 50. 1859.” Although Grisebach included *G. lucida* as the single species for *Excoecaria* sect. *Gymnanthes* (Sw.) Griseb., he, however, did not use the term type or its equivalent as required by the ICN Art. 7.10. Therefore, Webster (1967) was the first type species designator and the type of this genus name is *G. lucida*.

The type of *Gymnanthes* has important taxonomic consequences for *Dendrocousinsia*. If *G. elliptica* were to be type species of *Gymnanthes*, then all of the species of *Dendrocousinsia* needed to be transferred to *Gymnanthes*. Then *Gymnanthes* should be considered as endemic to Jamaica. Since *G. lucida* and *G. elliptica* are not sister species and since *Gymnanthes* sensu lato is polyphyletic, these taxonomic rearrangements would require additional name changes involving several other species of this genus. Webster’s designation of *G. lucida* has solved the problem.

The core of Swartz’ herbarium is housed in S, wherein his collection for *Gymnanthes elliptica* has three specimens (S11-341, S-R-2667, S-R-2668). Among these, only S11-341 carries a single label showing the name *G. elliptica*. This specimen is selected here as the lectotype as it matches the description, and there is no evidence that the specimen was collected after 1788. Furthermore, annotations or labels of specimens collected during 18–19th centuries quite often do not show dates. We also located relevant specimens at G-DC and BR. The label of the BR specimen, however, shows Swartz as the collector with an expression of doubt (“Legit Swartz?”). Although another specimen from Swartz’s collection of this species is housed at BM, it is on long term loan to another institution, and we were unable to study this material. In contrast, the specimen housed at G-DC has a label indicating that it was part of Swartz’ herbarium.

Excoecaria tinifolia Sw. (Swartz, 1800) is a superfluous illegitimate name because it includes *G. elliptica* as a synonym, and thus both names are homotypic and the name *E. tinifolia* is typified by the type of *G. elliptica*. Had Swartz (1800) made the new combination *E. elliptica*, he would have published a legitimate name.

“*Gymnanthes obtusa* Baill.” is an invalid name as it was published by Baillon (1858) without a description; however, specimens of *Dendrocousinsia elliptica* housed in P (P95484446, P95484447, P95484448, P95484449) that were donated by Hooker, have labels that refer to “*G. obtusa*” and match the information found in the single line that Baillon (1858) devoted to this name: “(coll. Hooker. – h. Mus.)” Baillon worked in P where his collections are also housed.

2. *Odontocline dolichantha* (Krug & Urb.) B. Nord., Opera Bot. 44: 25. 1978. = *Senecio fadyenii* var. *dolichanthus* Krug & Urb. in I. Urban, Symb. Ant. 1: 470. 1899. = *Senecio dolichanthus* (Krug & Urb.) S. Moore, J. Bot. 67: 130. 1929.

Type: “Hab. in Jamaica in Blue Mountains, prope Vinegar Hill 1400 m (4200 ft.) alt. Apr., Jun. flor.: W. Harris in Bot. Dep. Herb. N. 5113, 6352”

Lectotype (designated here): *W. Harris 6352* (UCWI).

The protologue of *Senecio fadyenii* var. *dolichanthus* referred to a single locality and to two collections made by William H. Harris (5113 and 6352), which constitute syntypes. We located *W. Harris 5113* in BM (BM001024018), and its label indicates that it was collected from Woodcutter’s Gap. In contrast, *W. Harris 6352* (housed at UCWI) was collected from Vinegar Hill and matches the only locality mentioned in the protologue. Most of Urban’s herbarium (including types) at B were destroyed during the Second World War (Hiepko, 1996), and B does not house either *W. Harris 5113* or *W. Harris 6352*. It is worth mentioning that the protologue makes reference to William Harris’s collections housed at UCWI (as “W. Harris in Bot. Dep. Herb.”). The BM specimen (*W. Harris 5113*) was examined by Nordenstam in 1976, and it was annotated as a “Type Specimen.” However, Nordenstam (1978), in his taxonomic treatment for *Odontocline*, neither typified the name *S. fadyenii* var. *dolichanthus* nor made any reference to this BM specimen. We decided to select the specimen at UCWI (*W. Harris 6352*) as the lectotype because of three reasons: (1) this Jamaican institution houses the core of William Harris’ collections, and his UCWI specimens are mentioned in the protologue, (2) the label of this specimen matches the only collecting site mentioned in the protologue, and (3) its leaves are intact and better preserved than those of *W. Harris 5113* housed at the BM.

3. *Odontocline fadyenii* (Griseb.) B. Nord., Opera Bot. 44: 25. 1978. = *Senecio fadyenii* Griseb., Fl. Br. W. Ind.: 382. 1861.

Described from: “Jamaica! Macf.”

Lectotype [first-step: designated by Nordenstam (1978): “Type: Jamaica, Macfadyen (K Iso?).” Lectotype [second-step: designated here]: *J. Macfadyen s.n.* (K000497648; Isolectotype: K000497647).

The protologue of *Senecio fadyenii* refers to a single collection: “Jamaica!, Macf.” The core of Grisebach’s herbarium is housed in GOET, which has a single specimen with a label showing: “Senecio Fadyenii Gr. Jamaica Macf.” The specimen consists of just one leaf and three flower fragments; this specimen, however, does not match all the characteristics provided in the protologue (e.g., “branches cylindrical; leaves lanceolate-oblong or oblong, corymbs few-branched ...”). Obviously, other specimens were used by Grisebach for his species description. According to Stafleu & Cowan (1976: 1007), many of the types of the taxa described by Grisebach in his *Flora of the British West Indian Islands* are at K. Indeed, K houses two specimens (K000497647 and K000497648) collected by Macfadyen in Jamaica, and one of them (K000497648) was already labeled as “isotype?” by Nordenstam in 1976. The two specimens

do not have lanceolate-oblong or oblong leaves but match other characters found in the protologue. Therefore, we believe that any one of these two specimens could be chosen as a lectotype. We selected K000497648 as it was the one that Nordenstam labeled as a potential type.

Regarding previous typifications of *Senecio fadyenii*, we provide the following details. Kruger and Urban (in Urban, 1899: 470), within the protologue of *S. fadyenii* var. *dolichanthus* Krug & Urb., mentioned “Typus *S. Fadyenii* Griseb.!” and provided contrasting characters between var. *fadyenii* and var. *dolichanthus*. However, for *S. fadyenii*, they did not provide any other detail for their type citation, such as the type locality, name of the collector or herbarium housing the type, collection date and/or number. It appears that Kruger and Urban (in Urban, 1899: 470) merely wanted to emphasize that they have seen the type of *S. fadyenii* and that it is different from the syntypes of var. *dolichanthus* (*William H. Harris 5113 & 6352*).

For the name *Senecio fadyenii*, Nordenstam (1978) stated “Type: Jamaica, Macfadyen (K Iso?).” From this short text, it seems that Nordenstam assumed that GOET has the holotype and the duplicates elsewhere (including at K) are isotypes. Alternatively, his citation of the query sign “?” may be construed as that Nordenstam doubted whether K has an isotype or the holotype. As discussed above, the specimen housed in GOET is not to be treated as the holotype. Since a holotype is not mentioned within the protologue, Nordenstam’s (1978) usage of the term “iso?” for the K specimen can be corrected to lectotype (ICN Art. 9.9). Although Nordenstam narrowed his inadvertent lectotypification to a single herbarium (K), it is noted here that K has two specimens, and in his publication, Nordenstam did not mention which of these two specimens is the type. Therefore, we construe his inadvertent lectotypification as Lectotype [first-step], and our designation (K000497648) here constitutes: Lectotype [second-step].

4. *Odontocline hollickii* (Britton ex Greenm.) B. Nord., Opera Bot. 44: 25. 1978. = *Senecio hollickii* Britton ex Greenm., Ann. Missouri Bot. Gard. 3: 201. 1916.

Type: “Jamaica: rocky hillside, Union Hill, near Moneague, Parish of St. Ann’s, alt. 450 m., 6–7 April, 1908, Britton & Hollick 2729 (N.Y. Bot. Gard. Herb., photograph and fragment in Mo. Bot. Gard. Herb.) type.”

Lectotype (designated here): “Union Hill, near Moneague (Parish of St. Ann’s),” *N.L. Britton and A. Hollick 2729* (NY00126716; Isolectotype: MO714664).

Although the protologue of *Senecio hollickii* mentions that Britton & Hollick 2729 is the type collection, no holotype was cited or indicated. Greenman’s (1916) statement [“(N.Y. Bot. Gard. Herb., photograph and fragment in Mo. Bot. Gard. Herb.) type.”] is construed as citation of syntypes housed at NY and MO (see ICN Art. 8.3 Ex. 5), and a lectotype designation is needed for the name *S. hollickii*. Therefore, we herewith designate the single specimen housed in NY as the lectotype and the fragment at MO as the isolectotype. The NY specimen matches the species description and already bears an annotation showing it as a type material.

5. **Tetrasiphon** Urb., Symb. Antill. 5: 83. 1904. Type: *Tetrasiphon jamaicensis* Urb., Symb. Antill. 5: 84. 1904.

Tetrasiphon jamaicensis Urb., Symb. Antill. 5: 84. 1904.

Described from: “Hab. in Jamaica ad Militia Target-Range, m. Jul. (1896) fruct.: W. Thompson n. 6501, ad Road to Wareka 66 m. alt. solo calcareo, m. Jan. fl. et fr.: W. Harris n. 8604.”

Lectotype (designated here): *W.H. Harris 8604* (UCWI02145; Isolectotypes: B 18 0003883, BM000838656, BM000838657, CAS0004792, NY00083835, NY00083836, UCWI02146, US01067800).

Urban described *Tetrasiphon* as a monotypic genus, and the protologue of its single species *T. jamaicensis* mentioned two collections (*W. Harris 8604* and *W. Thompson 6501*) from different localities, and the two collections represent syntypes. The collection of *W. Harris 8604* has been located in six herbaria (see above). Because Urban’s herbarium was housed in B and since B has a single specimen of *W. Harris 8604* (B 18 0003883), one might prefer the B specimen for lectotypification because it was most likely part of Urban’s study material for his species description. This specimen, however, is composed of several scattered fragments that do not readily match with the protologue description.

Therefore, it is evident that Urban’s species description was based on additional material(s), which either once existed at B but were lost in the Second World War or the additional material(s) he studied are located elsewhere, and either way, the name needs a lectotypification. Since we consider the B specimen (*W. Harris 8604*) as not an ideal candidate for typification, we alternatively looked for a suitable specimen elsewhere. Besides housing two specimens of *W. Harris 8604*, the NY has a specimen (NY01385852) with the label showing the collection number as 6501, the locality as Militia Target-Range, and the date as July 13 1896, but lacking the collector’s name. Nevertheless, we believe it is *W. Thompson 6501*. Since nine specimens of *W. Harris 8604* have been found with complete type collection data, we exclude *W. Thompson 6501* from our consideration for lectotypification. Of the nine specimens, we exclude the B specimen because of its fragmentary status (see above). Although anyone of the remaining eight specimens is eligible for a lectotypification, we choose *W. Harris 8604* (UCWI-02145) as the lectotype. This specimen matches well with the protologue description. It is emphasized here that for a lectotypification, any duplicate of the original material cited in the protologue, whether seen or unseen by Urban, is eligible (vide Art. 9.3 (b), (c)).

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