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Brittonia, Vol. 51, No. 4 (Oct. - Dec., 1999), 422-438.

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Angiosperm types from the Hawaiian collections of A. A. Heller

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Wagner, W. L. & R. K. Shannon (Department of Botany, MRC 166, National Museum of Natural History, Smithsonian Institution, Washington, DC 20560-0166, U.S.A.). Angiosperm types from the Hawaiian collections of A. A. Heller. *Brittonia* 51: 422–438. 1999.—The numbering system used by A. A. Heller for his 1895 Hawaiian collections has led to confusion regarding which specimens should be considered types. As part of a larger study of Hawaiian angiosperm types we have examined many of Heller's specimens and analyzed their status as types. We present the status of all specimens we have examined as well as those we are aware of from the literature. We have also constructed itineraries for Heller's collecting activities on his trip to the Hawaiian Islands on the islands of O'ahu and Kaua'i. Nomenclatural notes are given for all angiosperm basionyms based on Heller's Hawaiian collections. Lectotypifications are provided for *Cyperus hillebrandii* Boeck. var. *helleri* Kük., *Cyrtandra gayana* A. Heller, *Cyrtandra longifolia* (Wawra) Hillebr. ex C. B. Clarke var. *wahiawae* A. Heller ex Rock, *Euphorbia sparsiflora* A. Heller, *Isodendron subsessilifolium* A. Heller, *Lobelia tortuosa* A. Heller, *Nania tremuloides* A. Heller, *Pelea microcarpa* A. Heller, and *Suttonia angustifolia* Mez.

Introduction

In 1895, A. A. Heller collected vascular plants on the islands of O'ahu and Kaua'i in the Hawaiian Islands, and later published an enumeration of his collections (Heller, 1897). New fern taxa published in the flora were authored by L. M. Underwood and thus are not dealt with in this paper. Because of the number of previously undescribed taxa he collected, especially on Kaua'i, and the wide distribution of duplicates, Heller's specimens are an important part of the historical collections from the Hawaiian Islands. Twenty new flowering plant taxa were published in the flora (Heller, 1897), all based on Heller's collections. All flowering plant names were authored by Heller (except for grasses, which were authored by G. V. Nash). Later botanists, particularly E. E. Sherff, published many additional new taxa based on Heller's Hawaiian collections.

In the introductory pages of his flora, Heller made very few comments about his

expedition, focusing instead on a description of the islands themselves and their vegetation. He did not publish an itinerary; we have been able to use label data (primarily from specimens at US and BISH) and Heller's published citation of localities and dates to reconstruct his itinerary (Table I). From 18 March to 11 June, and again from 24 October to 13 November, he collected on O'ahu, and cited his collecting localities as "valley of Pauoa . . . and the heights above it, . . . especially the slopes of Konahuanui. . . the western slope of Makiki, and on 'Tantalus'. . . Several trips were made up Nuuanu valley to the Pali, one about half way up Waiolani, one up Kalihi valley to its head, and several to the region of Diamond Head. One trip was also made to Pearl river" (Heller, 1897: 768). From 24 June to 23 October Heller collected on Kaua'i, and nearly all of the new taxa he published were based on his Kaua'i collections. He did not cite collecting localities for Kaua'i as he did for O'ahu, but instead

he described the three "distinct floral areas" he encountered on Kaua'i. We were able to compose the following list from specimen label data: along the Hanapepe River, near the falls; ridge W of the Hanapepe River; ridge opposite Gay and Robinson's Hanapepe Valley house; between Hanapepe and Wahiawa Rivers; in and near bog at head of the Wahiawa [River]; at Wai-mea; and on Kaholuamanoa, above Wai-mea. Some of Heller's collections from Kaua'i have labels with the very general locality of "Hanapepe and Wahiawa Watershed," which has been noted in brackets in Table I; in many cases specimens with these labels appear to be part of the same gatherings as specimens with more detailed locality data on their labels.

We made a careful examination of Heller's Hawaiian collections, especially those that were used by him or other authors as types, as part of a project to examine types of all flowering plant names based on Hawaiian specimens. Upon comparing specimens from different herbaria, we discovered that Heller did not number his collections in the usual modern way, with each number representing a unique gathering. Instead, he often assigned the same number to aggregates of collections of what he considered to be the same taxon, even if collected on different dates. Usually specimens with the same number were collected at the same locality, though there were some exceptions. His numbers may have been intended as distribution numbers, but this interpretation is questionable because he sometimes gave different numbers to specimens of the same taxon. There are many discrepancies between dates cited in the flora for particular collections and dates on the labels of those collections; often Heller did not cite a date at all, or even cited a very broad range of dates (e.g., for *Heller 1970* he cited "March to October"). In other cases, the label gives a range of dates, but a specific day within that range is cited in the text. Whether the discrepancies and inconsistencies are due to sloppy editing, an incompetent assistant, or merely a lack of importance placed on collection dates by Heller is hard to know. What is clear is that Heller's failure to assign different numbers

to unique collections has caused considerable confusion for later researchers. It was probably at least in part due to Heller's numbering system that Sherff (1952) wrote, "In a number of other cases I have found Heller's specimens to have been distributed with "crossed labels."

Our analysis of names based on Heller collections and their types is presented below. We consider the first set of Heller's Hawaiian collections, including types, to be at MIN. This conclusion is based on the entry found in the footnote on page 760 of Heller's enumeration, which states: "A complete series of this collection, amounting to over one thousand specimens of ferns and flowering plants, and including some sixty type specimens, has been presented by Mr. A. A. Heller to the herbarium of the Geological and Natural History Survey. The whole makes an addition of quite inestimable value to the state collections—C. M. [Conway MacMillan, editor of *Minnesota Botanical Studies*]." Further support for this conclusion is found in Stafleu and Cowan (1979) stating that Heller's Hawaiian types only are at MIN, where he was employed at the time. We received confirmation of this from A. F. Cholewa, Curator of Vascular Plants at MIN (pers. comm., 1997). Heller's personal herbarium was purchased by BKL. We have confirmed (K. Barringer, pers. comm., 1998) that no Heller Hawaiian collections are at BKL, in further support that the Hawaiian material remained at MIN. This viewpoint also follows Recommendation 9A.4 of the International Code of Botanical Nomenclature. The Field Museum of Natural History set of Heller's collection has caused some confusion as to the disposition of Heller's first set. The F Heller collections are all stamped in blue ink with a shield within which is stated "Herbarium of A. A. Heller Purchased 1901." Some of the sheets are also stamped in red ink "Type." It seems clear that the stamp was to indicate a set of specimens that were purchased as a unit, not as an indication that they were Heller's personal herbarium, which was sold to BKL in 1913.

For the Hawaiian names published by Heller, we consider the sheet at MIN to be

TABLE I
ITINERARY FOR A. A. HELLER IN THE HAWAIIAN ISLANDS IN 1895

Itinerary on O'ahu

18 March	in and on the slopes of Makiki
20 March	at Waikiki
21 March	in and on the slopes of Makiki
22 March	Honolulu
23 March	in Nuuanu
25 March	base of Punchbowl
26 March	in Pauoa
27 March	Honolulu
28 March	Diamond Head
29 March	in Nuuanu
1 April	base of Punchbowl
2 April	along Tantalus
4 April	in Pauoa
5 April	in and on the slopes of Makiki
8 April	Diamond Head
9 April	in Nuuanu
11 April	along Tantalus
12 April	Diamond Head
17 April	Honolulu
19 April	along Tantalus
20 April	Honolulu
22 April	on the lower slopes of Konahuanui, above Manoa
23 April	at the Pali
24 April	at Salt Lake
25 April	on the lower slopes of Konahuanui, above Manoa
29 April	in Waialae
2 May	on and near the summit of Konahuanui
6 May	on the lower slopes of Konahuanui, above Manoa
7 May	Diamond Head
8 May	on the lower slopes of Konahuanui, above Manoa
9 May	at Waikiki
10 May	in Nuuanu
13 May	on the lower slopes of Konahuanui, above Manoa at Honolulu
16 May	in Pauoa
20 May	in Kalihi
23 May	on the lower slopes of Konahuanui, above Manoa
24 May	at the Pali
28 May	on the lower slopes of Konahuanui, above Manoa
3 June	on the lower slopes of Konahuanui, above Manoa
4 June	in lower Pauoa
6 June	on the lower slopes of Waiolani
11 June	near Pearl City
24 October	Waimanolo
29 October	at the Nuuanu Pali
30 October	on the lower slopes of Konahuanui, above Manoa
2 November	on and near the summit of Konahuanui
2-5 November	on the lower slopes of Konahuanui, above Manoa
6 November	Nuuanu
12-13 November	on the lower slopes of Konahuanui, above Manoa

Itinerary on Kaua'i

24-26 June	along the Hanapepe River, near the falls [Hanapepe and Wahiawa watershed] ^a
28 June	on the ridge W of the Hanapepe River
29 June	along the Hanapepe River, near the falls
2-8 July	along the Hanapepe River, near the falls
	along the Hanapepe River
	on the banks of the Hanapepe River
4 July	on the ridge W of the Hanapepe River [Hanapepe and Wahiawa watershed] ^c
9 July	ridge opposite Gay & Robinson's Hanapepe Valley house
11 July	on the ridge W of the Hanapepe River
12-13 July	along the Hanapepe River, near the falls

TABLE I
CONTINUED.

15 July	between the Hanapepe and Wahiawa Rivers
17 July	on the ridge W of the Hanapepe River [Hanapepe and Wahiawa watershed] ^a
18 July	between the Hanapepe and Wahiawa Rivers
19 July	along the Hanapepe River, near the falls
23 July	ridge opposite Gay & Robinson's Hanapepe Valley house on the ridge W of the Hanapepe River
24 July	along the Hanapepe River, near the falls
25 July	between the Hanapepe and Wahiawa Rivers
29 July	on the ridge W of the Hanapepe River [Hanapepe and Wahiawa watershed] ^a
6 August	on the ridge W of the Hanapepe River
8 August	between the Hanapepe and Wahiawa Rivers
12 August	in and near a bog at the head of the Wahiawa [River]
14 August	on the ridge W of the Hanapepe River along the Hanapepe River, near the falls
21 August	in and near a bog at the head of the Wahiawa [River]
22 August	on the ridge W of the Hanapepe River [Hanapepe and Wahiawa watershed] ^a
24 August	between the Hanapepe and Wahiawa Rivers
30 August	on Kaholuamanoa [Kaholuamanu], above Waimea
2-9 September	on Kaholuamanoa [Kaholuamanu], above Waimea
10-16 September	on Kaholuamanoa [Kaholuamanu], above Waimea on Kaholuamanoa [Kaholuamanu], above Waimea
24-30 September	on Kaholuamanoa [Kaholuamanu], above Waimea
1-8 October	on Kaholuamanoa [Kaholuamanu], above Waimea
4 October	on Kaholuamanoa [Kaholuamanu], above Waimea
11-16 October	in and near bog at head of Wahiawa [River]
19 October	along the Hanapepe River, near the falls
21 October	
23 October	at Waimea

^a A more general locality given on the labels of some specimens.

the holotype if there is no evidence that collections made on other dates were assigned the number designated as type by Heller. We consider the MIN sheet to be the holotype even in cases where we have seen specimens with the same number but more than one date, if Heller cited both number and date to designate the type. Any specimens with the same number but a different date or locality are not type material unless cited in the protologue as paratypes. When Heller cited a type number but no date, we consider specimens with the same number but collected on different dates to be syntypes (in some cases these have been lectotypified). Under "Possible Types" we include specimens that we have not seen (or otherwise have not confirmed the date of) that have the same number as the type; in most cases these were cited by the publishing author or a later monographer. Although many of these were cited as types by later authors, we have refrained from considering them types when there is any evidence

that more than one gathering (different dates or locality) was involved unless we have been able to confirm their dates. In cases where there is no evidence of more than one gathering involved we have included specimens cited by others followed by "n.v." We have used "[mfc]" to indicate NY specimens of which we have examined microfiche images. We have included the dates cited by Heller where they differ from dates on specimen labels, even for types of names by other authors, either to give a more precise date or because in at least some cases they undoubtedly indicate that specimens were distributed with dates other than the dates on specimens we have seen so far (e.g., for *Heller 2563*, the type of *Lipochaeta alata* Sherff, Heller cited "July to August"; we have seen specimens collected on two dates in July and in October). In the nomenclatural entries where more than one collection was distributed under a single number we refer to material constituting the holotype and any isotypes

as "primary types," to differentiate them from any other material that may have been cited in the protologue and are thus paratypes.

Heller's Hawaiian collections were widely distributed and our search has not been exhaustive. We have seen citations of specimens, or the actual specimens, from the following herbaria: A, AC, B, BISH, BM, CU, E, F, G, G-DC, GH, K, L, LE, MASS, MICH, MIN, MO, MSC, NY, P, PH, UC, US, and Z. In addition to many of these, Lanjouw and Stafleu (1957) list BRSL, CAL, CGE, H, LCU, MANCH, PN, and STR as having at least some sheets of Heller's Hawaiian angiosperm collections. Additional sources for the data presented here include citations in literature and communications with many researchers and collections staff. We have indicated those type collections that we have not seen. For additional non-type collections distributed under the same Heller number, we have combined any observations we have made with literature citations and personal communications during the project without distinguishing those we have personally examined.

Nomenclature

Basionyms are listed alphabetically within families; families are listed alphabetically. Current taxonomic disposition following Wagner et al. (1999) is in brackets following the type information if different from the basionym.

AMARANTHACEAE

Charpentiera obovata Gaudich. var. **elliptica** Hillebr., Fl. Hawaiian Isl. 375. 1888. TYPE: Kaua'i, above Waimea, Kaholuamanoa [Kaholuamanu], 4000 ft, 30 August 1895, A. A. Heller 2781 (NEOTYPE, designated by Sohmer, Brittonia 24: 294. 1972: BISH; ISONEOTYPES: A—n.v., GH—n.v., NY—n.v., P—n.v., US). Superfluous neotypification, as there is extant original material. A lectotype was designated by Wagner et al. (1986): *Pl. 44* in Sinclair, 1885, *Indigenous flowers of the Hawaiian Islands*. [= *Charpentiera elliptica* (Hillebr.) A. Heller.]

Nototrichium fulvum Schinz, Vierteljahrsschr. Naturf. Ges. Zürich 76: 142. 1931. TYPE: Kaua'i, on Kaholuamanu above Waimea [on an exposed slope on a ridge up to Kaholuamanu at 2500 ft], 24–30 September 1895, A. A. Heller 2831, pro parte (HOLOTYPE: Z—n.v.; ISOTYPES: BISH, MO [photo F], NY—n.v. [2; photos BISH, F], US [photos BISH, F]). Heller described the material distributed under *Heller 2831* as being collected in two locations: a smaller shrub with mostly obtuse, elliptic leaves on an exposed slope on a ridge up to Kaholuamanu at 2500 ft and a larger shrub with acute, elliptic-lanceolate leaves from a shaded site along the river, between the forks of the Waimea River, but listed only 24 September as the collection date. The holotype of *N. fulvum* based on Schinz's description is the sun form collected on the slope. Sherff saw material of both forms and used the two gatherings as the basis for the type of *Nototrichium sandwicense* var. *decipiens* (sun form) and *N. sandwicense* var. *helleri* (shade form); thus, the material Sherff saw of the former serve as isotypes of *N. fulvum*. One additional collection was distributed under *Heller 2831*, made on 10–16 September. [= *Nototrichium sandwicense*]

Nototrichium sandwicense (A. Gray) Hillebr. var. **decipiens** Sherff, Bot. Leaflet 2: 2. 1950. TYPE: Kaua'i, on ridge up to Kaholuamanu, between forks of Waimea River, on open exposed slope, 2500 ft, 24 September 1895, A. A. Heller 2831, pro parte (HOLOTYPE: US-265466 [photos BISH, F]; ISOTYPES: BISH, MO [photo F], NY—n.v. [2; mfc, photos BISH, F], Z—n.v.). Three collections were distributed under *Heller 2831* (see discussion under *Nototrichium fulvum*). Sherff used the collection made 24–30 September from the slope locality as the type for this name. This collection also serves as the type for *N. fulvum* Schinz. Another collection made in the canyon in a shaded site is the type for *N. sandwicense* var. *helleri* Sherff. Another collection numbered *Heller 2831*, not part of the type of any of these names, was made 10–16

September, but annotated and cited as isotypes by Sherff. [= *Nototrichium sandwicense* (A. Gray) Hillebr.]

Nototrichium sandwicense (A. Gray) Hillebr. var. **helleri** Sherff, Bot. Leaflet. 1: 3. 1950. TYPE: Kaua'i, Kaholuamanu, above Waimea [between forks of Waimea River, shaded site along the river], 24–30 September 1895, A. A. Heller 2831, pro parte (HOLOTYPE: F—n.v.; ISOTYPES: GH—n.v. [photo BISH]). Three collections were distributed under *Heller 2831* (see discussion under *Nototrichium fulvum*). Sherff used the collection made 24–30 September from a shaded site along the river as the type for this name. The other material labeled 24–30 September is from a slope above the river and serves as the type for *N. sandwicense* var. *decipiens*, and also the type of *N. fulvum* Schinz. Another collection numbered *Heller 2831*, not part of the type of any of these names, was made 10–16 September. Although Sherff did not cite an isotype at GH, he labeled the BISH photo of the GH sheet as *N. sandwicense* var. *helleri* and wrote the date as 24–30 September. K. N. Gandhi has confirmed that the date on the GH sheet is 24 September, which is the date Heller gives in his publication for this material. [= *Nototrichium sandwicense* (A. Gray) Hillebr.]

APOCYNACEAE

Rauvolfia helleri Sherff, Field Mus. Nat. Hist., Bot. Ser. 23: 329. 1947. TYPE: Kaua'i, on the ridge W of the Hanapepe River, 17 July 1895, A. A. Heller 2582, pro parte (HOLOTYPE: NY-180281; ISOTYPES: A—n.v., BISH, GH—n.v., F, NY—n.v.). Another collection distributed under *Heller 2582* was made 22 August (US), and is not a type. Probable isotypes (cited by Sherff): P, NY sheets not in mfc index. [= *Rauvolfia sandwicensis* A. DC.]

ARALIACEAE

Cheirodendron helleri Sherff, Bot. Leaflet. 5: 13. 1951. TYPE: Kaua'i, ridge west of Hanapepe R., [about two-thirds the dis-

tance from Hanapepe Bay to summit of Mt. Waialeale], 3000 ft, 22 August 1895, A. A. Heller 2496, pro parte (HOLOTYPE: US-265436 [photo F]; ISOTYPE: MO). Sherff cited other collections distributed under *Heller 2496* collected on 4 July (MIN, NY—n.v., P—n.v., UC—n.v.), and 11 July (BISH—n.v., CU—n.v. [photo F]) as paratypes, but clearly designated only the 22 August collection as the holotype and isotype. There is a specimen of this number at K, but the date needs to be checked. The BISH sheet was missing September 1997. [= *Cheirodendron trigynum* (Gaud.) A. Heller subsp. *helleri* (Sherff) Lowry.]

Tetraplasandra kawaiensis (H. Mann) Sherff var. **robustior** Sherff, Bot. Leaflet. 7: 12. 1952. TYPE: Kaua'i, above Waimea, on [above] Kaholuamanu, [on brow of plateau], 3500 ft, 10–16 September 1895, A. A. Heller 2884, pro parte (HOLOTYPE: BISH-488769 [photo F]; ISOTYPE: BISH). Specific epithet published as “*kawaiensis*” by Sherff, but as “*kawaiensis*” by H. Mann. Other material distributed as *Heller 2884* was collected 11–16 October (A—n.v. [photo F], GH—n.v., MO, US). There is a discrepancy between the published date and the date on the holotype. Both Heller and Sherff cited 16 October, but Sherff clearly designated the BISH sheet dated 10–16 September as the holotype. Probable isotypes (none seen, cited by Sherff): BH, F, PH, UC. Possible isotypes (seen by Lowry, not cited by Sherff): BM, CM, K, L. [= *Tetraplasandra kawaiensis* (H. Mann) Sherff.]

Tetraplasandra waimeae Wawra var. **angustior** Sherff, Bot. Leaflet. 6: 26. 1952. TYPE: Kaua'i, in and near bog at head of Wahiawa [Stream], 21 August 1895, A. A. Heller 2734, pro parte (HOLOTYPE: PH; ISOTYPES: BM—n.v., K—n.v., NY—n.v., P [3], UC—n.v.). Only part of the material distributed under this number are primary types for this entity. Other collections distributed as *Heller 2734* were made in and near bog at head of Wahiawa stream, 12 August (A), 19 October (US [photo F]); along Hanapepe River, near the falls, 14 August (GH [photo F]);

between Hanapepe and Wahiawa rivers, 24 August (MO); on Kaholuamanoa [Kaholuamano], 2–9 September (CU), 10–16 September (BISH [photo F], P [2]). Sherff cited the A, BISH, and P (10–16 September collection of the latter) sheets as paratypes, and cited the GH, MO, NY, UC, and US sheets under *T. waialealae* var. *wahiawensis*. There is an additional sheet at BISH as well as a sheet at W, the dates of which are not known. [= *Tetraplasandra waimeae* Wawra.]

ASTERACEAE

Bidens waimeana Sherff, Bot. Gaz. Crawfordsville 76: 164. 1923. TYPE: Kaua'i, on Kaholuamanoa [Kaholuamano] above Waimea, 1–8 October 1895, A. A. Heller 2848 (HOLOTYPE: MO- 5103505 [photos BISH, MO]; ISOTYPES: BM—n.v., F—n.v., GH—n.v., K—n.v., LE—n.v., MIN, NY—n.v. [mfc, photo BISH], UC—n.v., US). Sherff did not annotate the holotype, but he did write “=Type!” on the photos of the holotype. Heller did not cite this collection, and we have no evidence that any collections with this number were made on other dates. [= *Bidens sandvicensis* Less. subsp. *sandvicensis*.]

Dubautia laxa Hook. & Arn. var. *obovata* Sherff, Bot. Gaz. (Crawfordsville) 95: 80. 1933. TYPE: O'ahu, on or near the summit of [Pu'u] Konahuanui, 2 November 1895, A. A. Heller 2902, pro parte (HOLOTYPE: K—n.v. [photo F]; ISOTYPES: BISH [2], F—n.v., GH—n.v., MO, US). Sherff cited K sheet only, and added “pro parte” after collector number but did not explain why; in his monograph (1935: 97), however, he cited several other sheets of this collection under *D. laxa* var. *laxa* (F [2], G, GH, LE, NY, P [2]), excluding them from his new variety. Heller (1897: 918) mentions that “the broad and narrow leaved forms being found side by side.” Sherff was obviously segregating material of the two forms, naming the broad leaved one as *D. laxa* var. *obovata*. Sherff did not cite a date in the original publication, but cited 2 November in his monograph. [= *Dubautia laxa* Hook. & Arn. subsp. *laxa*.]

Lipochaeta alata Sherff, Bot. Gaz. (Crawfordsville) 95: 81. 1933. TYPE: Kaua'i, along the Hanapepe River, near the Falls, 12 July 1895, A. A. Heller 2563, pro parte (HOLOTYPE: F-429034; ISOTYPES: GH—n.v., NY—n.v. [mfc, photo F]). Other collections distributed under *Heller 2563* were made 2–8 July (US), 13 July (A—n.v.), and 21 October (BISH [5]), and are not primary type material. Heller (1897: 920) mentions a date range from July to August. He also specifically describes a plant with thinner and sharper serrated leaves from three miles above the first station. Thus at least two localities and four dates are involved with the material distributed under *Heller 2563*. Sherff saw specimens of the higher locality and cited them in the protologue as *Heller 2563a* (F, G); as we have not seen these it is not known what date they were collected or who added the “a.” None of the BISH sheets cited by Sherff were annotated by him, and although Sherff cited them and St. John annotated them isotypes they are not. A possible isotype is at P (date not known). [= *Lipochaeta connata* (Gaudich.) DC. var. *connata*.]

Lipochaeta integrifolia (Nutt.) A. Gray var. *major* Sherff, Bot. Gaz. (Crawfordsville) 95: 85. 1933. TYPE: O'ahu, on the old lava flow back of Diamond Head, 8 April 1895, A. A. Heller 2092, pro parte (HOLOTYPE: GH—n.v. [photo F]; ISOTYPES: A—n.v., MO, NY—n.v. [mfc, photo F], US). Other collections distributed under *Heller 2092* were made 12 April (BISH [2], F, NY [mfc]), and are not types. Probable isotypes (cited by Sherff): F, G, P. Possible isotypes (cited by Gardner, 1979: 333): G, K [2], UC. [= *Melanthera integrifolia* (A. Gray) W. L. Wagner & H. Rob. (ined.).]

Lipochaeta lobata (Gaudich.) DC. var. *albescens* Sherff, Bot. Gaz. Crawfordsville 95: 92. 1933. TYPE: O'ahu, Diamond Head, [steep slopes], 28 March 1895, A. A. Heller 2021 (HOLOTYPE: F-429425 [photo F]; ISOTYPES: A, GH [photo F], K, MO, NY [mfc, photo F], UC—n.v., US). We have no evidence that any collections with this number were made on other

dates. [= *Lipochaeta lobata* (Gaudich.) DC. var. *lobata*.]

Railliardia latifolia A. Gray var. **helleri** Sherff, Bot. Leaflet 7: 5. 1952. TYPE: Kaua'i, [west-central Kaua'i], on Kaholuamanoa [Kaholuamanu], above Waimea, 11–16 October 1895, A. A. Heller 2887 (HOLOTYPE: F—n.v. [photo F]; ISOTYPES: A—n.v., G—n.v., GH—n.v., K—n.v., LE—n.v., MO—n.v., NY—n.v., MSC—n.v., P—n.v., US). Sherff cited 11–16 October, and that is the date on the specimen labels; Heller cited 15 October. We have no evidence that any collections with this number were made on other dates. [= *Dubautia latifolia* (A. Gray) Keck.]

CAMPANULACEAE

Cyanea sylvestris A. Heller, Minnesota Bot. Stud. 1: 909. 1897. TYPE: Kaua'i, between the Hanapepe and Wahiawa Rivers, 2500–3000 ft, A. A. Heller 2691; SYNTYPES (with dates): 8 August (F, GH); 24 August (US); SYNTYPES (date unknown): (G [2], LE, MASS, MO, NY, P [2], UC, Z). MIN does not have any material of this number (A. F. Cholewa, pers. comm.). Heller did not cite a date. As we have not seen much of the syntype material and because this genus is currently under study by T. Lammers, who has studied these collections and provided us with information on them, we are reluctant to select a lectotype here. [= *Cyanea hirtella* (H. Mann) Hillebr.]

Delissea undulata Gaudich. subsp. **kauaiensis** Lammers, Syst. Bot. 13: 505. 1988. TYPE: Kaua'i, on the Hanapepe and Wahiawa watershed, 24 June 1895, A. A. Heller 2430, pro parte (HOLOTYPE: MSC; ISOTYPES: A, AC, BM, E, F [2], G, GH, K, MIN, NY, P, UC). At least two of the specimens published as isotypes are not, and are another collection distributed under Heller 2430 collected 2–8 July (MO, US); the dates of the sheets at other institutions have not been confirmed. Heller cited 25 June. [= *Delissea niuhauensis* H. St. John subsp. *kauaiensis* (Lammers) Lammers.]

Lobelia tortuosa A. Heller, Minnesota Bot.

Stud. 1: 912. 1897, nom. illegit., non Kuntze (1891). TYPE: Kaua'i, Hanapepe and Wahiawa watershed, [perpendicular cliffs along the Hanapepe River], 25 June 1895, A. A. Heller 2443, pro parte (LECTOTYPE, here designated: MIN-198245; ISOLECTOTYPES: A, BISH, F [2], GH [2], MASS, MO, NY [2, mfc, fragment BISH, photo BISH], P [2], US). Additional SYNTYPES: 24–26 June 1895, A. A. Heller 2443 (F [2], NY [mfc, fragment BISH, photo BISH], US); and 2–8 July 1895, A. A. Heller 2443 (MO, US). Heller did not cite a date and thus all of the collections distributed under this number are syntypes. [= *Lobelia niuhauensis* H. St. John.]

CARYOPHYLLACEAE

Schiedea helleri Sherff, Amer. J. Bot. 30: 607. 1943. TYPE: Kaua'i, on Kaholuamanoa [Kaholuamanu] above Waimea, 11–16 October 1895, A. A. Heller s.n. (HOLOTYPE: F-429310 [photos F (2)]).

Schiedea spergulina A. Gray var. **leiopoda** Sherff, Amer. J. Bot. 31: 151. 1944. TYPE: Kaua'i, south-central Kaua'i, along the Hanapepe River, near the Falls, 24–26 June 1895, A. A. Heller 2446, pro parte (HOLOTYPE: PH [photo F]; ISOTYPE: MIN). Sherff studied nine sheets of Heller 2446 collected 24–26 June. He segregated two of the sheets bearing senescent plants of Heller's collection as this entity while describing the seven sheets bearing more actively growing plants as *S. spergulina* var. *major*. Other collections distributed under Heller 2446 were collected 2–8 July (MO, US), and were cited as paratypes of *S. spergulina* var. *major*. Two labels were used on the June collection, the PH holotype gives the more general date of 24–26 June with the more specific locality, while the MIN sheet give 26 June for the date and the locality was given very generally as Hanapepe and Wahiawa watershed. [= *Schiedea spergulina* A. Gray.]

Schiedea spergulina A. Gray var. **major** Sherff, Amer. J. Bot. 31: 151. 1944. TYPE: Kaua'i, [south-central Kaua'i], along the Hanapepe River, near the Falls,

24–26 June 1895, A. A. *Heller 2446*, pro parte (HOLOTYPE: F-428945 [photos F (2)]; ISOTYPES: A, AC, CU, G, GH, NY, UC). Sherff studied nine sheets of *Heller 2446* collected 24–26 June. Sherff segregated two sheets bearing senescent plants of Heller's collection as *S. spergulina* var. *leiopoda* while describing seven sheets bearing more actively growing plants as this entity. Other collections distributed under *Heller 2446* were collected 2–8 July (MO, US), and were cited as paratypes by Sherff, however, both were annotated by him as "cotypes." Two labels were used on the June collection, most of the sheets give the more general date of 24–26 June with the more specific locality, while the A sheet give 26 June for the date and the locality was given very generally as Hanapepe and Wahiawa watershed Sherff cited CU, GH, NY, and UC sheets as "cotypes"; he did not cite A, AC, and G sheets, and their disposition based on Sherff's description. [= *Schiedea spergulina* A. Gray.]

Schiedea stellarioides H. Mann var. ***longifolia*** Sherff, Amer. J. Bot. 30: 606. 1943. TYPE: Kaua'i, on Kaholuamanoa [Kaholuamanu] above Waimea, 4000 ft, 30 August 1895, A. A. *Heller 2766*, pro parte (HOLOTYPE: PH; ISOTYPES: CU, F [photo F], G, GH, K, MIN, MO, NY, UC, US). Other collections distributed under *Heller 2766* were made 2–9 September (BISH [2], K, NY). These were not cited by Sherff, and therefore are not types. [= *Schiedea stellarioides* H. Mann.]

CYPERACEAE

Cyperus hillebrandii Boeck. var. ***helleri*** Kük., Pflanzenr. IV. 20 (Heft 101, 4): 484. 1936. TYPE: O'ahu, [Nu'uaniu] Pali, 29 October 1895, A. A. *Heller 2363* (LECTOTYPE, here designated: NY-11812; ISOLECTOTYPES: GH—n.v., MO—n.v.). Kuntenthal did not cite a date, and Heller did not cite this collection. Since the type at B was destroyed, we are here selecting a lectotype from among the available syntypes. Additional syntype: same locality

on 24 May (US). [= *Cyperus hillebrandii* Boeck. var. *hillebrandii*.]

EUPHORBIACEAE

Claoxylon helleri Sherff, Amer. J. Bot. 24: 88. 1937. TYPE: Kaua'i, Kaholuamanoa [Kaholuamanu], [edge of plateau] above Waimea, 11–16 October 1895, A. A. *Heller 2878*, pro parte (HOLOTYPE: F—n.v.; ISOTYPES: A—n.v., GH—n.v., BISH, MO, US). Other collections distributed under *Heller 2878* were made 10–16 September (BISH), and is not type material as it was not cited by Sherff in the protologue. The labels on at least some of the specimens give the more general date of 11–16 October. Probable isotypes (cited by Sherff): B [presumably destroyed], K, P. [= *Claoxylon sandwicense* Müll. Arg.]

Euphorbia atrococca A. Heller, Minn. Bot. Stud. 1: 844. 1897. TYPE: Kaua'i, Hanapepe and Wahiawa watershed, [on the ridge west of the Hanapepe River], 3000 ft, 4 July 1895, A. A. *Heller 2500*, pro parte (HOLOTYPE: MIN-147973; ISOTYPES: A, GH, NY [mfc]). Other collections distributed under *Heller 2500* were made 11 July (GH), 17 July (BISH [5], US) and 22 August (MO, US), and are not types. Koutnik (1987) erroneously considered BISH and US sheets to be isotypes. Possible isotypes: CU, F, K, MSC. [= *Chamaesyce atrococca* (A. Heller) Croizat & O. Deg.]

Euphorbia celastroides Boiss. var. ***hanapepensis*** Sherff, Bot. Gaz. (Crawfordsville) 97: 597. 1936. TYPE: Kaua'i, along the Hanapepe River near the falls, 700 ft, 2–8 July 1895, A. A. *Heller 2429*, pro parte (HOLOTYPE: MO-140866; ISOTYPE: US). Other collections distributed under *Heller 2429* were made 24–26 June (A—n.v., GH—n.v., BISH [3], MIN, NY [mfc]), and are not primary type material. Sherff clearly distinguished between specimens of *Heller 2429* collected 24–26 June and those collected 2–8 July, and cited only the US sheet as an isotype. Possible isotypes: CU, MSC. The paratypes cited by Sherff (F [2], GH, K, NY) probably all represent the same collec-

tion, although the locality on the K sheet is given as "Hanapepe and Wahiawa watershed," and the date is 24 June. Koutnik (1987) erroneously considered specimens at BISH, F, GH, K, and MIN to be isotypes. [= *Chamaesyce celastroides* (Boiss.) Croizat & O. Deg. var. *hanapepensis* (Sherff) O. Deg. & I. Deg.]

Euphorbia rivularis A. Heller, Minnesota Bot. Stud. 1: 846. 1897. TYPE: Kaua'i, Hanapepe River, near the falls, 24–26 June 1895, A. A. Heller 2441, pro parte (LECTOTYPE, designated by Koutnik, *Alertonia* 4: 342. 1987: MIN; ISOLECTOTYPES: BISH [2], CU—n.v., F [3]—n.v., K, NY—n.v., P—n.v., US-2064345). Additional syntypes under *Heller 2441* at the same locality were collected 28 June (GH), and 2–8 July (MO, US). The K and MIN sheets have a more specific date printed on the label of 25 June, but a somewhat less specific locality of Hanapepe and Wahiawa watershed. Heller did not cite a date, and cited locality as "banks of Hanapepe river . . . elevation of about 600 feet." Koutnik (1987) erroneously considered the MIN sheet to be the holotype, but under ICBN Art. 9.8 we take this as a lectotypification. He also erroneously considered some of the other syntypes to be isotypes. [= *Chamaesyce celastroides* (Boiss.) Croizat & O. Deg. var. *hanapepensis* (Sherff) O. Deg. & I. Deg.]

Euphorbia sparsiflora A. Heller, Minnesota Bot. Stud. 1: 846. 1897. TYPE: Kaua'i, in and near bog at head of the Wahiawa River, 12 August 1895, A. A. Heller 2699, pro parte (LECTOTYPE, here designated: US-2064353; ISOLECTOTYPES: BISH [5], F [2]—n.v., GH—n.v., MO, NY [mfc]). Additional syntypes collected at same locality on 21 August (P), and 19 October (CU, F [2], US). Heller did not cite a date, and thus all are considered syntypes. MIN does not have this collection (A. F. Cholewa, pers. comm.), although Koutnik (1987) cited the holotype as being there. Heller distributed these collections as "*E. wahiawae* (ined.)." [= *Chamaesyce sparsiflora* (A. Heller) Koutnik.]

FABACEAE

Canavalia kauaiensis J. D. Sauer, *Brittonia* 16: 176. 1964. TYPE: Kaua'i, Kaholuamanoa [Kaholuamanu], above Waimea, 2500 ft, 25 September 1895, A. A. Heller 2827 (HOLOTYPE: MIN-136244; ISOTYPES: A—n.v., BM—n.v., F—n.v., G—n.v., GH—n.v., K—n.v., L—n.v., MICH—n.v., MO, NY—n.v., P—n.v., UC—n.v., US, Z—n.v.). We have no evidence that any collections with this number were made on more than one date. The labels on at least some of the specimens give the more general date of 24–30 September.

GESNERIACEAE

Cyrtandra gayana A. Heller, Minnesota Bot. Stud. 1: 887. 1897. TYPE: Kaua'i, on the ridge W of the Hanapepe River [Hanapepe and Wahiawa watershed, 915 m], 4 July 1895, A. A. Heller 2495, pro parte (LECTOTYPE, here designated: MIN-191254; ISOLECTOTYPE: NY [mfc]). Heller distributed three collections from Kaua'i under *Heller 2495*. The additional syntypes are: ridge W of Hanapepe River, 3000 ft, 11 July (BISH [2]); and 22 August (US). Heller did not cite a date. Although the MIN sheet has the more general locality of "Hanapepe and Wahiawa watershed," it is assumed to be part of the same gathering as the NY sheet. [= *Cyrtandra longifolia* (Wawra) Hillebr. ex C.B. Clarke.]

Cyrtandra longifolia (Wawra) Hillebr. ex C. B. Clarke var. *wahiawae* A. Heller ex Rock, *Amer. J. Bot.* 6: 211. 1919. TYPE: Kaua'i, between Hanapepe and Wahiawa Rivers, 25 July 1895, A. A. Heller 2624, pro parte (LECTOTYPE, here designated: GH; ISOLECTOTYPES: BISH [2], NY [2], US). Heller discussed two forms of *C. longifolia* and mentions the name *C. wahiawae*, which he clearly states he is not publishing, and Rock only refers to Heller's distribution number, not differentiating between the two collections, so one must be selected as a lectotype. Rock also mentioned that this collection was distributed to various herbaria under two names, *C. longifolia* and *C. wahiawae*,

the CU sheet being an example of the former, the GH sheet an example of the latter. Heller did not cite a date. The CU sheet is dated 24 August, and was distributed as *C. longifolia*; it was annotated by Rock as "*C. longifolia* var. *wahiawae* (Heller) Rock." There is a US sheet dated 24 August. [= *Cyrtandra longifolia* (Wawra) Hillebr. ex C. B. Clarke.]

Cyrtandra pubinervis H. St. John, *Phytologia* 64: 41. 1987. TYPE: Kaua'i, along the Hanapepe River, near the falls, 2–8 July 1895, A. A. Heller 2490 (HOLOTYPE: BISH-521344 and -521345; ISOTYPES: NY, US). St. John erroneously cited the collector number as Heller 2440, which is a specimen of *Hedyotis elatior* (H. Mann) Fosberg. We have no evidence that any collections with this number were made on other dates. Heller cites the more specific date of 5 July. [= *Cyrtandra oenobarba* H. Mann.]

LAMIACEAE

Phyllostegia helleri Sherff, *Bot. Gaz.* (Crawfordsville) 96: 138. 1934. TYPE: Kaua'i, above Waimea, Kaholuamanoa [Kaholuamanu], 11–16 October 1895, A. A. Heller 2875 (HOLOTYPE: US-368712; ISOTYPES: F—n.v., GH—n.v., MO, NY [mfc]). MO sheet annotated by Sherff "Cotype!" Sherff also wrote "Oct. 12" on Heller's label on the MO sheet. Sherff cited 12 October, but labels of holotype and at least some isotypes bear the more general date of 11–16 October.

LILIACEAE

Astelia argyrocoma A. Heller ex Skottsberg, Bernice P. Bishop Mus. Bull. 117: 31. 1934. TYPE: Kaua'i, 1895, A. A. Heller 2752; SYNTYPES: Hanapepe and Wahiawa watershed, 22 August (MIN); on Kaholuamanoa [Kaholuamanu], above Waimea, ♂, 10–16 September (BISH [2], NY [mfc]), 1–8 October (MO—n.v., NY [mfc]); ♀, ridge W of the Hanapepe River, s.d. (G—n.v., K—n.v., LE—n.v.); ♀, Kaholuamanu, s.d. (GH—n.v., P—n.v.); s.l. Skottsberg specifically did not designate a type; thus all of the collections must be considered syntypes. We refrain

from designating a lectotype because the proper designation of a lectotype is complex. Collections from at least three dates are involved and the sex of each one must be determined.

Astelia veratroides Gaudich. var. ***gracilis*** Skottsberg, Bernice P. Bishop Mus. Bull. 117: 28. 1934. TYPE: O'ahu, on and near summit of Konahuanui, 2 November 1895, A. A. Heller 2903, pro parte (HOLOTYPE: US-265513; ISOTYPES: GH—n.v., MO, NY [mfc]). Another collection distributed under Heller 2903 was made on the slopes of Konahuanui above Manoa, 2–5 November (F), and was cited by Skottsberg as a paratype. Although the F sheet may have been collected on the same date, but it was collected at a different locality. Skottsberg erroneously cited date of F paratype as 25 November. Heller did not cite this collection. [= *Astelia menziesiana* Sm.]

LOGANIACEAE

Labordia helleri Sherff, *Amer. J. Bot.* 25: 581. 1938. TYPE: Kaua'i, on the ridge W of the Hanapepe River, 17 July 1895, A. A. Heller 2579, pro parte (HOLOTYPE: F—n.v.; ISOTYPES: A—n.v., BISH [3], GH—n.v., MIN, NY [2, mfc]). Other collections distributed under Heller 2579 were made 22 August (US) and s.d. [possibly 22 August] (MO [2]), and are paratypes. Probable isotypes (cited by Sherff): B [presumably destroyed], CU, K, P. Sherff cited a NY sheet dated 22 August, but both NY sheets on mfc are dated 17 July.

Labordia helleri Sherff var. ***macrocarpa*** Sherff, *Amer. J. Bot.* 25: 582. 1938. TYPE: Kaua'i, above Waimea, Kaholuamanoa [Kaholuamanu], 1–8 October 1895, A. A. Heller 2868 (HOLOTYPE: US-264136; ISOTYPES: F, GH—n.v., MO, NY [mfc]). Heller cited 25 September so some specimens may have been distributed with that date, although Sherff claimed that Heller's "printed labels all give Oct. 1–8 as the date of collection." [= *Labordia helleri* Sherff.]

MALVACEAE

Hibiscus waimeae A. Heller, Minnesota Bot. Stud. 1: 851. 1897. TYPE: Kaua'i, Kaholuamanoa [Kaholuanu, above] Waimea, 3000 ft, 2–9 September 1895, A. A. Heller 2785 (HOLOTYPE: MIN-153322; ISOTYPES: BISH, NY [2], US). Heller did not cite a date. We have no evidence that any collections with this number were made on other dates. [= *Hibiscus waimeae* A. Heller subsp. *waimeae*.]

MYRSINACEAE

Myrsine mezii Hosaka, Occas. Pap. Bernice P. Bishop Mus. 16(2) 34. 1940. TYPE: Kaua'i, ridge W of Hanapepe River, 6 August 1895, A. A. Heller 2679, pro parte (HOLOTYPE: BISH-188899; ISOTYPE: BISH). Another collection distributed under Heller 2679 was made 22 August (US), and is not a type.

Suttonia angustifolia Mez, Pflanz. IV. 236 (Heft 9): 337. 1902. TYPE: Kaua'i, bog at head of Wahiawa Valley, 12 August 1895, A. A. Heller 2700, pro parte (LECTOTYPE, here designated, US-2074620; ISOLECTOTYPES: BISH [5]). An earlier Lectotype was designated by Hosaka (Occas. Pap. Bernice P. Bishop Mus. 16(2): 45. 1940): B [presumably destroyed]. As this lectotype was destroyed a new one is here selected. Published as *S. angustifolia* (Heller) Mez, based on *Myrsine angustifolia* Heller, but there is no such basionym; Heller cites this collection under his combination *Myrsine lanceolata* (Wawra) Heller. At least some of the specimens were distributed with the name *M. tenuifolia* (ined.). Additional syntype: O'ahu, Remy 462 (Herb. Boiss-Bareby, L, P). Hosaka (1940, p. 45) thought that the specimen Mez saw was probably at B. Another collection distributed as Heller 2700 was made 19 October (US), and is not an isolectotype. There was no MIN sheet of this number included in the loan to us. The only specimens Hosaka saw were sheets at BISH. [= *Myrsine helleri* (O. Deg. & I. Deg.) H. St. John.]

MYRTACEAE

Nania glabrifolia A. Heller, Minnesota Bot. Stud. 1: 866. 1897. TYPE: Kaua'i, Kaholuamanoa [Kaholuanu], [on the plateau] above Waimea, 4000 ft, 10–16 September 1895, A. A. Heller 2821 (HOLOTYPE: MIN-159153; ISOTYPES: K—n.v., NY [mfc], US). Heller did not cite a date. We have no evidence that any collections with this number were made on other dates. [= *Metrosideros polymorpha* Gaudich. var. *glaberrima* (H. Lév.) H. St. John.]

Nania pumila A. Heller, Minnesota Bot. Stud. 1: 864. 1897. TYPE: Kaua'i, in and near bog at the head of the Wahiawa [River], 3000 ft, 21 August 1895, A. A. Heller 2738, pro parte (HOLOTYPE: MIN-159162; ISOTYPES: A, GH—n.v. [fragment BISH], K—n.v., NY [mfc]). Other collections distributed under Heller 2738 were made 19 October (BISH, US), and are not types. Rock (1917) cited "type in Gray Herbarium" and that is the sheet represented in his plate 24 (Harvard stamp faintly legible); 21 August can be read on the label. The fragment of the GH sheet at BISH has a label in Rock's handwriting and no date is given on the label. [= *Metrosideros polymorpha* Gaudich. var. *pumila* (A. Heller) J. W. Dawson & Stemmer.]

Nania tremuloides A. Heller, Minnesota Bot. Stud. 1: 866. 1897. TYPE: O'ahu, Nu'uaniu Pali, 29 October 1895, A. A. Heller 2895 (LECTOTYPE, here designated: US-265488; ISOLECTOTYPES: BISH, MIN, NY [mfc]). Additional SYNTYPE: lower slopes of Konahuanui, above Manoa, 12–13 November 1895 (BISH [2], US). Heller cited his number 2895, but the specimens distributed under this number are apparently from two localities as delimited above. Heller did not cite a date, and thus all collections with this number are syntypes. [= *Metrosideros tremuloides* (A. Heller) Knuth.]

PIPERACEAE

Peperomia helleri C. DC., Annuaire Conserv. Bot. Genève 2: 283. 1898. TYPE: Kaua'i, ridge W of Hanapepe River, July

1895, A. A. Heller 2632, pro parte (HOLOTYPE: G-DC—n.v.). Other collections distributed under Heller 2632 were made on Kaholuamanoa [Kaholuamanu], above Waimea, 2–9 September (GH—n.v.) and Kaua'i, ridge W of Hanapepe River, 22 August (US), and are not types. Heller cited July to October, so some specimens may have been distributed with other dates; de Candolle cited only "July 1895." [= *Peperomia cookiana* C. DC.]

PITTIOSPORACEAE

Pittosporum helleri Sherff, Amer. J. Bot. 28: 23. 1941. TYPE: Kaua'i, Kaholuamanoa [Kaholuamanu], above Waimea, 2–9 September 1895, A. A. Heller 2783, pro parte (HOLOTYPE: GH—n.v.; ISOTYPES: BISH [3], MO, NY [mfc], US). Another collection distributed under Heller 2783 was made 30 August (F), and is a paratype as it was cited by Sherff in the protologue. Probable isotypes (cited as "cotypes" by Sherff): A, B, F, K, MIN. Possible isotypes (not cited by Sherff): BM, MASS. Heller did not cite a date. [= *Pittosporum glabrum* Hook. & Arn.]

PLANTAGINACEAE

Plantago princeps Cham. & Schtdl. var. **anomala** Rock, Amer. J. Bot. 7: 203. 1920. TYPE: Kaua'i, Hanapepe Valley, ridge opposite Gay and Robinson's Hanapepe Valley house, 23 July 1895, A. A. Heller 2610, pro parte (HOLOTYPE: GH—n.v. [fragment BISH]; ISOTYPE: A—n.v.). Other collections distributed under Heller 2610 were made on the ridge west of Hanapepe River, 22 August (US), and are not types as they were not cited in the protologue. Holotype not examined, but there is photo of it in Rock's publication. BISH fragment has no locality data or date.

POACEAE

Syntherisma helleri Nash, in Heller, Minnesota Bot. Stud. 1: 798. 1897. TYPE: O'ahu, Pauoa, 16 May 1895, A. A. Heller

2321 (HOLOTYPE: MIN-74442; ISOTYPES: BISH, GH—n.v., NY [mfc], US). Nash did not cite a date. We have no evidence that any collections with this number were made on other dates. [= *Digitaria violascens* Link.]

PRIMULACEAE

Lysimachia hanapepeensis H. St. John, Phytologia 64: 44. 1987. TYPE: Kaua'i, on the Hanapepe Watershed, ridges W of Hanapepe River, 3000 ft, 23 July 1895, A. A. Heller 2614, pro parte (HOLOTYPE: BISH; ISOTYPES: A—n.v., F—n.v., GH—n.v., NY [mfc]). St. John added an "A" to the sheets he considered to be part of the type collection, and segregated them from other sheets of Heller 2614, which is the type of *Lysimachia hillebrandii* var. *helleri* (see discussion below). [= *Lysimachia kalalauensis* Skottsbo.]

Lysimachia hillebrandii Hook. f. ex A. Gray var. **helleri** R. Knuth, in Pax & Knuth, Pflanzenr. IV. 237 (Heft 22): 310. 1905. TYPE: Kaua'i, on the Hanapepe and Wahiawa Watershed, 3000 ft, 23 July 1895, A. A. Heller 2614, pro parte (LECTOTYPE, designated by St. John, Phytologia 64: 45. 1987: BM—n.v.). The holotype at B was destroyed in World War II. Knuth did not cite a date, nor did Heller. Two collections made on different dates were distributed under Heller 2614, the 23 July collection used as the type of *L. hanapepeensis* (for which St. John added an "A" to some of the sheets) and the U.S. specimen, which is dated 22 August (an additional syntype). It seems odd that St. John would use a duplicate of the 23 July collection as the lectotype rather than one of the 22 August sheets, but perhaps he thought the 23 July collection was mixed material. Possible isolectotypes: MO—n.v., P—n.v. For unknown reasons Marr and Bohm (1997) include this name as a nomenclatural synonym of *L. kalalauensis*, which is based on a different type. [= *Lysimachia kalalauensis* Skottsbo.]

Lysimachia longa H. St. John, Phytologia 64: 46. 1987. TYPE: Kaua'i, in and near a bog at the head of the Wahiawa [River],

19 October 1895, A. A. Heller 2736, pro parte (HOLOTYPE: BISH-63966; ISOTYPES: BISH, F, US). Other collections distributed under Heller 2736 were made 12 August (F, MIN) and 21 August (GH, NY [mfc]), and are not types. St. John did not cite a date. St. John annotated the NY sheet as an isotype. Possible isotypes: MASS, MO, P [3] (cited by Marr and Bohm (1997), but they did not cite dates for any of them). [=*Lysimachia daphnoides* (A. Gray) Hillebr.]

RUBIACEAE

Gouldia elongata A. Heller, Minnesota Bot. Stud. 1: 897. 1897. TYPE: Kaua'i, [ridge] between Hanapepe and Wahiawa Rivers, [in wet boggy woods], 2500 ft, 15 July 1895, A. A. Heller 2606, pro parte (HOLOTYPE: MIN-193904). There is a discrepancy between the date Heller cited (25 July) and the date on the MIN sheet (15 July). The word "type" is written on the label of the MIN sheet, and we take it to be the holotype, assuming that the date cited by Heller is an error. Other collections distributed under Heller 2606 were collected at the head of the valley opposite Gay & Robinson's Hanapepe valley house, 23 July (explicitly excluded by Heller, citing them under *Kadua knudsenii*); between the Hanapepe and Wahiawa Rivers, 25 July (BISH [2], NY [2], US); and on the ridge west of the Hanapepe River, 22 August (MO, US), and are not types. There are two sheets at BISH that are possible isotypes, but these could not be located in August 1997. [=*Hedyotis terminalis* (Hook. & Arn.) W. L. Wagner & D. R. Herbst.]

Gouldia sambucina A. Heller, Minnesota Bot. Stud. 1: 898. 1897. TYPE: Kaua'i, Kaholuamanoa [Kaholuamanu], edge of plateau above Waimea, 3500 ft, 11–16 October 1895, A. A. Heller 2879 (HOLOTYPE: MIN-193910; ISOTYPES: NY [mfc], US). Heller did not cite a date. We have no evidence that other collections with this number were made on other dates [=*Hedyotis terminalis* (Hook. & Arn.) W. L. Wagner & D. R. Herbst.]

Straussia psychotrioides A. Heller, Min-

nesota Bot. Stud. 1: 904. 1897. TYPE: Kaua'i, [edge of plateau] above Waimea, Kaholuamanoa [Kaholuamanu], 3500 ft, 10–16 September 1895, A. A. Heller 2885, pro parte (LECTOTYPE, designated by Sohmer, *Lyonia* 1: 134. 1977: BISH-67317; ISOLECTOTYPES: BISH, MO). Additional syntypes: 11–16 October (A—n.v., GH—n.v., MIN, NY, US). Sohmer did not cite a date, nor did Heller. Possible isotype (cited by Sohmer): F (not located (F. Barrie, Pers. comm., 1999). Sohmer cited GH, MIN, NY, and US sheets as isotypes but they are not (because they were collected 11–16 October). [=*Psychotria greenwelliae* Fosberg.]

Straussia pubiflora A. Heller, Minnesota Bot. Stud. 1: 905. 1897, non **Psychotria pubiflora** (A. Gray) Fosb. (1942). TYPE: O'ahu, above Manoa, lower slope of Konahuanui, [heights of Pauoa], 13 May 1895, A. A. Heller 2300 (HOLOTYPE: MIN-194586; ISOTYPES: A—n.v., BISH [2], F—n.v., GH—n.v., MO, NY—n.v., US). "Heights of Pauoa" was the locality cited by Heller, but we have not seen any specimen labels from 13 May with that locality. Sohmer erroneously cited the US sheet as the holotype and the MIN sheet as an isotype. We have no evidence that any collections with this number were made on other dates. [=*Psychotria kaduana* (Cham. & Schltld.) Fosberg.]

RUTACEAE

Pelea cruciata A. Heller, Minnesota Bot. Stud. 1: 839. 1897. TYPE: Kaua'i, Kaholuamanoa [Kaholuamanu], above Waimea, 10–16 September 1895, A. A. Heller 2809 (HOLOTYPE: MIN-146229; ISOTYPES: A—n.v., AC—n.v., E—n.v., GH—n.v., K—n.v., MO—n.v., NY [mfc], P—n.v., US). Stone (1969) erroneously cited the US sheet as the holotype; he did not cite a MIN sheet. Heller did not cite a date. We have no evidence that any collections with this number were made on other dates.

Pelea microcarpa A. Heller, Minnesota Bot. Stud. 1: 839. 1897. TYPE: Kaua'i,

Kaholuamanoa [Kaholuamanu], above Waimea, 4000 ft, 2–9 September 1895, A. A. Heller 2636 (LECTOTYPE, here designated: US-968458). Additional SYNTYPES: Hanapepe and Wahiawa watershed, 29 July (K—n.v. [photo BISH], MIN, NY); ridge W of Hanapepe River, 22 August (US); Kaholuamanoa [Kaholuamanu], above Waimea, 10–16 September (BISH [2]). Heller did not cite a date. Date unknown for specimens at AC, CU, E, K [photo BISH], P. Stone (1969) cited *Heller 2636* as the type collection, but did not designate a lectotype. [= *Melicope clusiifolia* (A. Gray) T. G. Hartley & B. C. Stone.]

URTIACEAE

Neraudia kauaiensis (Hillebr.) R. S. Cowan var. *helleri* R. S. Cowan, Pacific Sci. 3: 261. 1949. TYPE: Kaua'i, Kaholuamanoa [Kaholuamanu], above Waimea, 1–8 October 1895, A. A. Heller 2847 (HOLOTYPE: NY [mfc]; ISOTYPES: A—n.v., GH—n.v., US). [= *Neraudia kauaiensis* (Hillebr.) R. S. Cowan.]

Neraudia melastomaefolia Gaudich. var. **pubescens** R. S. Cowan, Pacific Sci. 3: 249. 1949. TYPE: Kaua'i, Kaholuamanoa [Kaholuamanu], above Waimea, 2–9 September 1895, A. A. Heller 2792 (HOLOTYPE: BISH-583935; ISOTYPES: A—n.v., BISH [2], G—n.v., GH—n.v., MICH—n.v., NY [mfc], P—n.v., UC—n.v., US). Heller cited 24 September; we have not seen any specimens with that date. We have no evidence that any collections with this number were made on other dates. [= *Neraudia melastomifolia* Gaudich.]

Pipturus helleri Skottsbg., Acta Horti Gothob. 7: 4. 1931. TYPE: Kaua'i, Kaholuamanoa [Kaholuamanu], above Waimea, 2–9 September 1895, A. A. Heller 2786 (HOLOTYPE: GH—n.v. [photo BISH]; ISOTYPES: G—n.v., K—n.v., L—n.v., NY [mfc], US). Heller cited 2 September; Skottsberg did not cite a date. Date on GH sheet and US sheet is 2–9 September. We have no evidence that any collections with this number were made on other

dates. [= *Pipturus albidus* (Hook. & Arn.) A. Gray.]

Pipturus kauaiensis A. Heller, Minnesota Bot. Stud. 1: 815. 1897. TYPE: Kaua'i, along the Hanapepe River, near the falls [Hanapepe and Wahiawa watershed], 24 June 1895, A. A. Heller 2428; SYNTYPES: BISH [2], GH—n.v., MIN [2], NY [3, mfc], US). Although the two sheets at MIN were both collected on the same date (the date cited by Heller), they are considered syntypes because they are of different sexes. Dates on specimens distributed under *Heller 2428*: 24 June (MIN [2]); 24–26 June (BISH, GH—n.v.[2], NY, US); 2–8 July (US); 24 July (US). Heller cited 24 June. Locality info on BISH, NY, US sheets: Along the Hanapepe River, near the falls (more specific than on MIN sheets).

Pipturus ruber A. Heller, Minnesota Bot. Stud. 1: 815. 1897. TYPE: Kaua'i, Kaholuamanoa [Kaholuamanu], above Waimea, [below Gay & Robinson's house, stream banks], 4000 ft, 1–8 October 1895, A. A. Heller 2852, pro parte (HOLOTYPE: MIN-99954; ISOTYPES: GH—n.v., NY [mfc], US). Although at least three different collections were included under *Heller 2852* Heller specifically gave the date of 4 October in the protologue, the date on the MIN sheets and therefore consider it the holotype. Other collections distributed under *Heller 2852* were made: 2–9 September (BISH [3]) and 10–16 September (US), and are not types. The labels on at least some of the specimens give the more general date of 1–8 October (GH, NY).

VIOLACEAE

Isodendrion subsessilifolium A. Heller, Minnesota Bot. Stud. 1: 856. 1897. TYPE: Kaua'i, above Waimea, Kaholuamanoa [Kaholuamanu], in a ravine between the forks of the Waimea River, 2000 ft, 24–30 September 1895, A. A. Heller 2828 (LECTOTYPE, here designated: US-265463; ISOLECTOTYPES: A—n.v., GH—n.v., MIN, NY). Additional syntype: 10–16 September (BISH). Date not yet checked: E, L.

Heller did not cite a date. [= *Isodendrion laurifolium* A. Gray.]

Acknowledgments

We are indebted to the following herbarium staff for providing us with information about their collections and, in some cases, loans: F. Barrie (F), K. A. Barringer (BKL), D. E. Boufford (GH), A. F. Cholewa (MIN), R. Dirig (CU), K. N. Gandhi (GH), P. K. Holmgren (NY), C. Jarvis (BM), W. T. Kitzredge (GH), C. J. Niezgodna (F), J. C. Solomon (MO), G. W. Staples (BISH). We would like to thank P. P. Lowry II (Araliaceae) and T. G. Lammers (Campanulaceae) for providing unpublished data, and G. Carr, an anonymous reviewer, and especially F. Barrie for providing very useful comments in the review process.

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Appendix: Numerical List of Basionyms Based on Heller Collections

- 2021 *Lipochaeta lobata* (Gaudich.) DC. var. *albescens* Sherff
- 2092 *Lipochaeta integrifolia* (Nutt.) A. Gray var. *major* Sherff
- 2300 *Straussia pubiflora* A. Heller
- 2321 *Syntherisma helleri* Nash
- 2363 *Cyperus hillebrandii* Boeck. var. *helleri* Kük.
- 2428 *Pipturus kauaiensis* A. Heller
- 2429 *Euphorbia celastroides* Boiss. var. *hanapepensis* Sherff
- 2430 *Delissea undulata* Gaudich. subsp. *kauaiensis* Lammers
- 2441 *Euphorbia rivularis* A. Heller
- 2443 *Lobelia tortuosa* A. Heller
- 2446 *Schiedea spergulina* A. Gray var. *leiopoda* Sherff
- 2446 *Schiedea spergulina* A. Gray var. *major* Sherff
- 2490 *Cyrtandra pubinervis* H. St. John
- 2495 *Cyrtandra gayana* A. Heller
- 2496 *Cheirodendron helleri* Sherff
- 2500 *Euphorbia atrococca* A. Heller
- 2563 *Lipochaeta alata* Sherff
- 2579 *Labordia helleri* Sherff
- 2582 *Rauvolfia helleri* Sherff
- 2606 *Gouldia elongata* A. Heller
- 2610 *Plantago princeps* Cham. & Schldtl. var. *anomala* Rock
- 2614 *Lysimachia hanapepensis* H. St. John
- 2614 *Lysimachia hillebrandii* Hook. f. ex A. Gray var. *helleri* R. Knuth
- 2624 *Cyrtandra longifolia* (Wawra) Hillebr. ex C. B. Clarke var. *wahiawae* A. Heller ex Rock
- 2632 *Peperomia helleri* C. DC.
- 2636 *Pelea microcarpa* A. Heller
- 2679 *Myrsine mezii* Hosaka
- 2691 *Cyanea sylvestris* A. Heller
- 2699 *Euphorbia sparsiflora* A. Heller
- 2700 *Suttonia angustifolia* Mez
- 2734 *Tetraplasandra waimeae* Wawra var. *angustior* Sherff
- 2736 *Lysimachia longa* H. St. John
- 2738 *Nania pumila* A. Heller
- 2752 *Astelia argyrocoma* A. Heller ex Skottsbo.
- 2766 *Schiedea stellarioides* H. Mann var. *longifolia* Sherff

- 2783 *Pittosporum helleri* Sherff
 2785 *Hibiscus waimeae* A. Heller
 2786 *Pipturus helleri* Skotts. b.
 2792 *Neraudia melastomaefolia* Gaudich. var. *pubescens* R. S. Cowan
 2809 *Pelea cruciata* A. Heller
 2821 *Nania glabrifolia* A. Heller
 2827 *Canavalia kauaiensis* J. D. Sauer
 2828 *Isodendron subsessilifolium* A. Heller
 2831 *Nototrichium fulvum* Schinz
 2831 *Nototrichium sandwicense* (A. Gray) Hillebr. var. *deci piens* Sherff
 2831 *Nototrichium sandwicense* (A. Gray) Hillebr. var. *helleri* Sherff
 2847 *Neraudia kauaiensis* (Hillebr.) R. S. Cowan var. *helleri* R. S. Cowan
 2848 *Bidens waimeana* Sherff
 2852 *Pipturus ruber* A. Heller
 2868 *Labordia helleri* Sherff var. *macrocarpa* Sherff
 2875 *Phyllostegia helleri* Sherff
 2878 *Claoxylon helleri* Sherff
 2879 *Gouldia sambucina* A. Heller
 2884 *Tetraplasandra kavaiensis* (H. Mann) Sherff var. *robustior* Sherff
 2885 *Straussia psychotrioides* A. Heller
 2887 *Railliardia latifolia* A. Gray var. *helleri* Sherff
 2895 *Nania tremuloides* A. Heller
 2902 *Dubautia laxa* Hook. & Arn. var. *obovata* Sherff
 2903 *Astelia veratroides* Gaudich. var. *gracilis* Skotts. b.
 s.n. *Schiedea helleri* Sherff