

Updates to the Hawaiian hornwort (Antheroцерotophyta) and liverwort (Marchantiophyta) floras: Species new to Hawai‘i and name changes¹

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INTRODUCTION

Since Staples & Imada’s (2006) literature-based checklist of the hornworts (Antheroцерotophyta) and liverworts (Marchantiophyta) of Hawai‘i, our field, herbarium, and literature review work has disclosed 20 species new for Hawai‘i, including two hornworts. In addition, 35 species and one subspecies have name changes; these include the proposed new combinations *Cryptolophocolea bartlettii*, *Cuspidatula labrifolia*, *Leptoscyphus baldwinii*, and *Vitalianthus pseudoneurus*. Two species are here confirmed for Hawai‘i (*Lophocolea pusilla* and *Nothoceros vincentianus*), and nomenclature is corrected for two species (*Frullania sandvicensis* and *Scapania ornithopoides*).

This paper is based on seven visits (totaling about 30 days of herbarium work there) to the Herbarium Pacificum, Bernice Pauahi Bishop Museum (BISH), the National Tropical Botanical Garden herbarium (PTBG) on Kaua‘i (one six-day visit), and the Hawaii Volcanoes National Park herbarium (HAVO) in Volcano, Hawai‘i numerous times (approximately 30 days of work); extensive field work on the islands of Hawai‘i and Lāna‘i and some field work on O‘ahu, Maui, and Kaua‘i, collecting over 3,000 hornwort and liverwort specimens; and extensive literature research aided by Interlibrary Loan services at the University of Wisconsin-Stevens Point.

It is important to note that this paper does not deal with numerous new island records for species already known to occur in Hawai‘i. The island occurrences listed for “name change” species are only those given in Staples & Imada (2006); many more island records will be added in a subsequent paper. “All major islands” denote Kaua‘i, O‘ahu, Moloka‘i, Maui, and Hawai‘i.

There are also about 15 species of liverworts new to science, all Hawaiian endemics, and these will also be treated in a subsequent paper.

We follow the synonymy of Staples & Imada (2006), updated through the Söderström *et al.* (2016) checklist of world liverworts and the current version of Tropicos.org (<https://www.tropicos.org/home>) through September 2023.

RESULTS

Twenty species and one subspecies are newly reported for Hawai‘i, including two hornworts (one indigenous and one naturalized) and 18 leafy liverworts (17 indigenous and one naturalized species). Of these, five species are similar but not identical to species from

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Asia or America; they require more research to find their proper specific epithet. In addition, 35 species and one subspecies in the Staples & Imada (2006) list have name changes; we propose the new combinations *Cryptolophocolea bartlettii*, *Cuspidatula labrifolia*, *Leptoscyphus baldwinii*, and *Vitalianthus pseudoneurus*. Two species are confirmed for Hawai‘i (*Lophocolea pusilla* and *Nothoceros vincentianus*), and nomenclature is corrected for two species (*Frullania sandvicensis* and *Scapania ornithopoides*).

ANTHOCEROTOPHYTA (hornworts)

Anthocerotaceae

Anthoceros angustus Steph.

New state record

Indigenous; found on Haleakalā, Maui and both ranges on O‘ahu (610–1220 m). In 2006, a BISH specimen from Mt Ka‘ala, O‘ahu, made by Paul Higashino in 1975, was annotated as *A. formosae* Steph. by D. Christine Cargill (Australian National Herbarium), a hornwort authority. That name is now a synonym of *A. angustus* (Peng & Zhu 2013; Lee & Gradstein 2021: 112; Lee *et al.* 2022). We were able to verify its continued existence on Mt Ka‘ala in 2022.

Material examined. O‘AHU: Wai‘anae Range, Mt Ka‘ala, along roadside on embankment, 4,000 ft [1,219 m], 22 Feb 1975, P. Higashino s.n. (BISH 684456); same day and place, E.J. Funk s.n. (BISH 684459); at and near summit of Mt Ka‘ala, 17 May 2022, 1,219 m, M.K. Thomas, S.N. Ching *et al.* (including the authors) 363a (BISH); Ko‘olau Range, central ridge adjacent to Niu Valley, 9 Feb 1911, C.N. Forbes 1910.O (BISH); Tantalus, 11 Aug 1935, R.D. Svihla 35-204 (BISH). MAUI: Haleakalā, Waikamoi, rainforest, 2,000 ft [610 m], 3 Jan 1956, R.D. Svihla 1886 (BISH); Waikamoi Preserve, 1,830 m, 23 Feb 2023, A.V. Freire & E.J. Judziewicz 23-98 (BISH).

Anthoceros punctatus L.

New naturalized record

A cosmopolitan species (Gradstein 2021: 643–644); rare, Hawai‘i Island (1,205 m), clearly naturalized. This hornwort grows on soil in disturbed and exposed areas that are often mown.

Material examined. HAWAII: Hawaii Volcanoes National Park, Kīpukapuauulu, mowed picnic area lawn and trailside, moist bare packed soil, 1,205 m, 7 Feb 2020, A.V. Freire & E.J. Judziewicz 20-92 (HAVO); same location, 19 Mar 2021, A.V. Freire & E.J. Judziewicz 21-346 (HAVO); Nāmakaniipaio Campground, lawn, 1,205 m, 30 Nov 2022, A.V. Freire & E.J. Judziewicz 22-962 (HAVO).

Dendrocerotaceae

Nothoceros vincentianus (Lehm. & Lindenb.)

Confirmation of a previous tentative record

J.C. Villarreal

Indigenous; this neotropical species was long treated as *Megaceros vincentianus* (Lehm. & Lindenb.) Campb., but molecular evidence suggests that the two genera are distinct (Villarreal *et al.* 2010). It grows on logs and bark of trees, in deep rain forest; it is not common but can be found on Kaua‘i and Hawai‘i Island in Hawaii Volcanoes National Park (Nāhuku Lava Tube area, ‘Ōla‘a Tract), and the Pu‘u Maka‘ala Natural Area Reserve from 853–1,478 m. We suspect a much broader Hawai‘i distribution; we have not examined the specimens tentatively cited as this species (as “*Megaceros ? vincentianus*”) by Miller (1963: 530). Miller *et al.* (1983) again cited this species as occurring in Hawai‘i, but Staples & Imada (2006: 22) list it as a dubious species. We can confirm its occurrence in Hawai‘i; it differs from *Megaceros flagellaris* (Mitt.) Steph. in its lack of gemmae on the completely smooth dorsal surface of the thallus.

Material examined. **KAUAI:** Kōke'e Camps, near Kōke'e Stream, ca. 3,500 ft [1,067 m], 18 Feb 1956, *R.D. Svihla 2101* (BISH). **HAWAII:** Pu'u Maka'ala N.A.R., 1,340 m, 16 Jun 2022, *A.V. Freire & E.J. Judziewicz 22-620* (BISH); Hawaii Volcanoes National Park, Nāhuku Lava Tube, 1,190 m, 26 May 2022, *A.V. Freire & E.J. Judziewicz 22-564* (HAVO); Hawaii Volcanoes National Park, 'Ōla'a Tract, 1 km from first bend, 1,150 m, 28 Mar 1979, *P.J. Burton 405* (BISH); Kūlani Prison Road to Forestry Camp, 4,850 ft [1,478 m], 19 Dec 1954, *E.T. Ozaki 1178* (BISH); South Kona Distr, Hōnaunau Forest Reserve, on 'a'ā in open wet *Fraxinus uhdei* plantation, 2,800 ft [853 m], 18 Sep 1975, *D.R. Herbst & S. Ishikawa 5456* (BISH).

MARCHANTIOPHYTA (liverworts)

Acrobolbaceae

Acrobolbus integrifolius (A. Evans) Briscoe **Name change**

Treated as *Tylimanthus integrifolius* A. Evans by Staples & Imada (2006). See Briscoe *et al.* (2015: 59) and Söderström *et al.* (2016: 94). Endemic; an uncommon species of wet forests on Moloka'i and Maui.

Adelanthaceae

Cuspidatula labrifolia (H.A. Mill.) A.V. Freire & Judz., **comb. nov.**

Basionym: *Jamesoniella labrifolia* H.A. Mill., *J. Hattori Bot. Lab.* 30: 275. 1967, and treated as that species by Staples & Imada (2006).

The type locality is Mile 15 on the Saddle Road on Hawai'i Island (Miller 1967), and it is also found on Moloka'i and Maui (610–2,790 m). These are large plants, usually red or with some red coloration, with rounded, imbricate, erect, and markedly pouched or concave leaves unlike the plane or slightly concave leaves of *C. robusta*.

Cuspidatula robusta (Austin)

Váňa & L. Söderstr.

Name change

Treated as *Jamesoniella robusta* (Austin) Steph. by Staples & Imada (2006). See Váňa *et al.* 2013a. Endemic; one of the larger, showier leafy liverworts in Hawai'i; found on all major islands and Lāna'i (Judziewicz *et al.* 2023), from 305–2,460 m, and on other islands in Oceania.

Aneuraceae

Aneura pinguis (L.) Dumort.

New state record

These are the first records of this cosmopolitan genus and species in Hawai'i. It is indigenous.

Material examined. **KAUAI:** Lihu'e Distr, Blue Hole, headwaters North Fork Wailua River, 22.065332°N, 159.491517°W, low-statured wet shrubland over rubble, thallus bright green, mat-forming on rocks, 600 m, 16 Feb 2016, *T. Flynn 8272* (PTBG). **O'AHU:** Mt Ka'ala, 21°30'18–30"N, 158°08'36–45"W, dripping rocks of roadside embankment below the summit, common, 1,200 m, 9 Nov 2022, *M.K. Thomas et al. 499, 503b, 520a, 523, 539* (BISH).

Aytoniaceae

Mannia californica (Gottsche ex Underw.)

L. C. Wheeler

New state record

This sub-cosmopolitan species (United States, Canada, Europe, Asia and Africa; Schill 2007) is a new report for Hawai'i.

Material examined. **KAUAI:** Po'omau Canyon, on dripping wet face in full sun, secondary forest dominated by *Aleurites*, understory of *Triumfetta*, *Plumbago*, and *Lantana*, in an area heavily grazed by goats; thallus dull medium green, 427–549 m [1,400–1,800 ft], 19 Jan 1993, T. Flynn, S. Perlman & K. Wood 5208 (PTBG).

Calypogeiaceae

Asperifolia arguta (Nees & Mont.)

A.V. Troitsky, Bakalin & Maltseva

Name change

Treated as *Calypogeia arguta* Nees & Mont. by Staples & Imada (2006). Indigenous; found on all major islands (244–1,219 m). Bakalin *et al.* (2022: 26, 34–35) present convincing molecular evidence that this species and its relatives are basal to *Calypogeia* and should be transferred to the new segregate genus *Asperifolia*. Furthermore, they present molecular evidence that *A. arguta* is a strictly European species that does not occur in Asia (and presumably Oceania). They propose the new species *A. indosinica* Bakalin & A.V. Troitsky to accommodate Asian collections with smaller cells and smaller underleaves, and it seems possible that Hawaiian material may pertain to this species rather than to *A. arguta*. Previous to the Bakalin *et al.* papers (2020, 2022), Sun *et al.* (2018: 160) give the range of *A. arguta* (as *Calypogeia arguta*) as eastern Asia and Malesia, disjunct in Hawai'i.

Cephaloziaceae

Cephalozia lucens (A. Evans) Steph.

Name change

Treated as *Metahygrobiella lucens* (A. Evans) H.A. Mill. by Staples & Imada (2006). See Söderström *et al.* (2016: 58) and Vána *et al.* (2013d). Endemic; Maui (Kīpahulu and Pu'u Ni'ani'au) and Lāna'i (Judziewicz *et al.* 2023), from 914–2,438 m. Wet rocks and montane forests; perhaps not distinct from *C. maxima*, in which case this older name would apply.

Cephalozia maxima Steph.

Name change

Treated as *Metahygrobiella maxima* (Steph.) N. Kitag. by Staples & Imada (2006). See Söderström *et al.* (2016: 58). Endemic; Maui (686–914 m) and reportedly Lāna'i (Judziewicz *et al.* 2023).

Fuscocephaloziopsis baldwinii (C.M. Cooke)

Vána & L. Söderstr.

Name change

Treated as *Cephaloziella baldwinii* (C.M. Cooke) H.A. Mill. by Staples & Imada (2006). Endemic; this is a tiny creeping species found on Kaua'i, Moloka'i, Maui, and Hawai'i (914–1,768 m), but is not common.

Fuscocephaloziopsis connivens (Dicks.)

Vána & L. Söderstr. subsp. *sandwicensis*

(Mont.) Vána & L. Söderstr.

Name change

Treated as *Cephalozia sandwicensis* (Mont.) Spruce by Staples & Imada (2006). See Vána *et al.* (2013d). Indigenous; the subspecies is also indigenous (it is also reportedly found in French Polynesia; Bardat *et al.* 2021: 81). This is a common species of wet forests on all major islands and Lāna'i (Judziewicz *et al.* 2023), 183–2,012 m.

Odontoschisma denudatum* (Mart.) Dumort.**subsp. *denudatumName change**

Treated as *Odontoschisma subjulaceum* Austin by Staples & Imada (2006). See Aranda *et al.* 2014: 1008–1025; Gradstein & Ilkiu-Borges (2015). Indigenous; often in drier, sunnier locations and less common than the next subspecies; on all major islands.

Odontoschisma denudatum* subsp. *sandvicense

(Ångstr.) Gradst., S.C. Aranda & Vanderp.

Name change

Treated as *Odontoschisma sandvicense* (Ångstr.) A. Evans by Staples & Imada (2006). See Aranda *et al.* (2014: 1019) and Gradstein & Ilkiu-Borges (2015). Endemic; this commoner subspecies tends to prefer shadier, moister locations than the typical subspecies; on all major islands and Lānaʻi (Judziewicz *et al.* 2023).

Cephaloziellaceae***Cephaloziella kiaeri* (Austin) Douin****Name change**

Treated as *Cephaloziella lilae* (C.M. Cooke) Douin by Staples & Imada (2006). Almost pantropical; indigenous. Uncommon; Kauaʻi and Oʻahu (600–1,219 m); treated as *Cylindrocolea kiaeri* (Austin) Váňa by Váňa *et al.* (2013c), as *Cephaloziella lilae* in Staples & Imada (2006), and more recently as *Cephaloziella kiaeri* by Lee & Gradstein (2021: 52).

***Cylindrocolea* cf. *planifolia* (Steph.)**

R.M. Schust.

New state record

Indigenous; this bright green, montane mesic or wet forest species, appears similar to the widespread American *C. planifolia* (Gradstein & Costa 2003). It is found on Hawaiʻi Island (1,280–1,760 m) in Kīpukakī, Hawaii Volcanoes National Park and in the Puʻu Makaʻala N.A.R.

Material examined. **HAWAII:** Hawaii Volcanoes National Park, Kīpukakī, 1,345 m, 7 Mar 2021, *A.V. Freire & E.J. Judziewicz 21-334* (HAVO); same location, 7 Apr 2023, *A.V. Freire & E.J. Judziewicz 23-330* (HAVO); Puʻu Makaʻala N.A.R., near old Mauna Loa Boys School, *Metrosideros-Cibotium* kīpuka, 1,760 m, 19 Aug 2021, *A.V. Freire & E.J. Judziewicz 21-664* (BISH).

Frullaniaceae***Frullania sandvicensis* Ångstr.,**[*Frullania ericoides* (Nees) Mont., misidentification

(see So & Wang 2006: 428–429)].

Correction***Frullania sandvicensis* Ångstr.,**[*Frullania neurota* Taylor, misidentifications]

(see So & Wang 2006: 428–429).

Correction**Geocalycaceae*****Geocalyx lancistipulus* (Steph.) S. Hatt.****New state record**

Indigenous; rare, an otherwise Asian species (Asthana & Murti 2009) known from one 2021 collection from Hawaiʻi Island: Nāmakanipaio Campground, Hawaii Volcanoes National Park. Only one other species of *Geocalyx* occurs in Hawaiʻi, the Holarctic *G. graveolens* (Schrad.) Nees, known from one collection on Hawaiʻi Island; it differs from *G. lancistipulus* in lacking gemmiparous shoots and in its more deeply lobed leaves.

Material examined. **HAWAII:** Hawaii Volcanoes National Park, Nāmakanipaio Campground, in deep shaded rock cleft, 1,205 m, 27 Oct 2021, *A.V. Freire & E.J. Judziewicz 21-943* (HAVO).

Gymnomitriaceae

Gymnomitrium cf. *laceratum* (Steph.) Horik. **New state record**

Indigenous; first report for Hawai‘i. This species is known in Hawai‘i only from Kīpahulu Ridge, Haleakalā, made by Marko Lewis in 1981. *Gymnomitrium* is an easy genus to identify based on its dense, cushiony habit, gray color, and wormlike, very densely leafy stems only about 0.6 mm wide. The leaves are bifid and strongly concave. Closely related to *Marsupella*. Norton G. Miller (1942–2011) annotated both specimens as *Gymnomitrium laceratum*, a species with a scattered cosmopolitan distribution. However, in 2017, Yuri Mamontov annotated them as “similar to” *G. mucrophorum* R.M. Schust., an Alaskan endemic, noting the shoots without rhizoids, leaves with crenulate margins, and verruculose cuticle. We consulted the papers of Schuster (1974, 1995), Mamontov *et al.* (2019), as well as the provisional Flora of North America treatment (FNA Editors 2020; <http://www.mobot.org/plantscience/bfna/V3/Gymnomitriaceae.html>), and we tentatively concur with N.G. Miller’s initial determination. The plants have leaves that have 2–3 rows of roundish silvery marginal cells differing from the colored, rectangular median cells; the leaf margins are slightly crenulate; and each lobe apex is mucronate. However, the leaves are bifid only about 1/3 of their length and rhizoids were not evident.

Material examined. **MAUI:** Haleakalā, Kīpahulu Ridge, Haleakalā, on a dirt bank above tree line, 2,408 m, 4 Oct 1981, *M. Lewis 81-388b, 81-397* (BISH, F).

Marsupella emarginata (Ehrh.) Dumort. **New state record**

Indigenous; a cosmopolitan (but mainly Holarctic) species found rarely in wet montane forests on Kaua‘i (1,250 m) and on both ranges on Maui (1,372–1,524 m). This species is unique among bifid Hawaiian liverworts in that the leaf lobes apices are quite rounded and are not at all acute. See Lee & Gradstein (2021: 61–62, 173).

Material examined. **MAUI:** without locality, anno 1875, *D.D. Baldwin 65* (BISH) [mixed with *Sphenobolus minutus*]; West Maui, ‘Eke Bog, 4,500 ft [1,372 m], *R.L. Stemmermann 7034* (HAVO); Haleakalā, ‘Ukulele, up Pipe Trail, Jul 1919, *C.N. Forbes 1462* (BISH). **KAUA‘I:** Hanalei Distr, Halele‘a Forest Reserve, Nāmolo-kama Mt., 17 Jun 1988, central plateau bog, with *Metrosideros*, *Pelea*, *Labordia*, and *Juncus planifolius*, 4,100 ft [1,250 m], *T. Flynn 3021* (BISH) [incidental to *Rhynchospora chinensis* (Cyperaceae)].

Herbertaceae

Herbertus aduncus (Dicks.) Gray **Name change**

Treated as *Herbertus sanguineus* (Mont.) Austin by Staples & Imada (2006). Juslén (2006) treats *H. sanguineus* as a synonym of *H. dicranus* (Gottsche, Lindenb. & Nees) Trevis.; in turn, Sun & He (2019) present molecular evidence that *H. dicranus* is a synonym of *H. aduncus*. Found on all major islands and Lāna‘i (Judziewicz *et al.* 2023).

Jubulaceae

Jubula javanica Steph. **Name change**

Treated as *Jubula hutchinsiae* (Hook.) Dumort. subsp. *javanica* (Steph.) Verd. by Staples & Imada (2006). See Lee & Gradstein (2021: 89). An indigenous, mostly Asian species that is found on all major islands and Lāna‘i (Judziewicz *et al.* 2023), 762–1,890 m. It is rare; we have only seen it twice. It is often terrestrial on perennially wet organic soil, or

at the base of trees. See Lee & Gradstein (2021: 89) and our discussion under *J. pennsylvanica* (below). A key to distinguish the two Hawaiian species is presented below.

1. Leaves narrowly ovate, their apices long-acuminate; leaf margin with (0–)1–3 teeth; female bracts and bracteoles with irregularly toothed or spinose margins .. ***J. javanica***
 1'. Leaves broadly ovate, their apices shortly-apiculate; leaf margin entire, without teeth; female bracts and bracteoles with entire margins ***J. pennsylvanica***

***Jubula pennsylvanica* (Steph.) A. Evans New state record**

Indigenous; Maui (1,524–1,890 m). *Jubula* collections from Hawai‘i need more attention. So far, all specimens are reported as *J. javanica* (formerly *J. hutchinsiae* subsp. *javanica*; see above), but this species, known from North America and Asia (Dey *et al.* 2011) is also present. While *J. javanica* has narrowly ovate leaves with long-acuminate apices, leaf margin with (0–)1–3 teeth, and female bracts and bracteoles with irregularly toothed or spinose margins; *J. pennsylvanica* has broadly ovate leaves with short-apiculate apices, entire leaf margins, and female bracts and bracteoles with entire margins. These key differences are based on Guerke (1978), Dey *et al.* (2011), and Sukkharak (2013); however, inconsistencies are found between the latter two papers regarding the circumscription of *J. javanica*. Our specimens fit the description by Dey *et al.* (2011), except for having cylindrical rather than galeate lobules.

Material examined. MAUI: Haleakalā, Ko‘olau-Hāna Distr, Helele‘ike‘oha, *Metrosideros* montane wet forest and bogs, 6,200 ft [1,890 m], 4 Nov 2021, K. Severson 051 (BISH); West Maui, ravines, 4,000 ft [1,219 m], anno 1875, D.D. Baldwin 147 (BISH).

Lejeuneaceae

***Acrolejeunea sandvicensis* (Gottsche) Steph. Name change**

Treated as *Trocholejeunea sandvicensis* (Gottsche) Mizut. by Staples & Imada (2006). See Wang *et al.* (2016) and Söderström *et al.* (2016: 399). Indigenous; found on all major islands and Lāna‘i (Judziewicz *et al.* 2023), 0–1,160 m, but mostly below 600 m); it is disjunct from subtropical eastern Asia and previous reports from other Pacific Islands are erroneous (Sun *et al.* 2018). This is a wet forest, low elevation species that is a common epiphyte on both exotic and indigenous trees, but it can also grow on rocks.

***Cololejeunea planissima* (Mitt.) Abeyw. Name change**

Treated as *Cololejeunea lanciloba* Steph. by Staples & Imada (2006). See Gradstein (2021: 452). Indigenous; found on Kaua‘i, O‘ahu, and Lāna‘i (Judziewicz *et al.* 2023), 0–610 m; also in Asia, Australia and Oceania. Common, typically very closely appressed to bark in lowland forests, on both indigenous and exotic trees.

***Drepanolejeunea pentadactyla* (Mont.) Steph. New state record**

Ko‘olau Range, O‘ahu (610 m); indigenous; also occurring in tropical Asia (Lee & Gradstein 2021: 230), Australasia, and New Caledonia. This species resembles *D. unguilata* (Steph.) Grolle, but has much larger and more irregular leaf teeth, the leaves often appearing almost randomly lobed. Mentioned in passing (as the synonym *D. micholitzii* Steph.) by Smith *et al.* (1997), but without a specimen citation.

Material examined. O‘AHU: Kīpapa Gulch, 2,000 ft [610 m], twining on *Herbertus gracilis*, 2 Apr 1933, E.Y. Hosaka 951b (BISH); Wa‘ahila Ridge Trail, growing on trunk of *Metrosideros*, 11 May 1979, C.S. Futa 48 (BISH).

Lejeunea adpressa* Nees*Name change**

Treated as *Lejeunea anisophylla* Mont. by Staples & Imada (2006). Indigenous; found on all major islands and Lānaʻi (Judziewicz *et al.* 2023), 0–1,860 m; common. Cosmopolitan; see Gradstein (2021: 514). According to Gaik Ee Lee (pers. comm.), authority on tropical Asian species of *Lejeunea*, the *L. adpressa* complex is not a natural group.

Lejeunea laetevirens* Nees & Mont.*New naturalized record**

An American species found in Hoʻomaluhia Botanical Garden on windward Oʻahu and at Onomea on Hawaiʻi Island, at elevations of less than 40 m. This is a minute bark epiphyte or leaf epiphyll in urban areas and botanical gardens, first noted in 2019. A good description and illustration may be found in Gradstein & Ilkiu-Borges (2009: 101–102).

Material examined. OʻAHU: Hoʻomaluhia Botanical Garden, on tree trunks, 30 m, 5 Nov 2021, E.J. Judziewicz 21-986 (BISH). HAWAII: Onomea, 19°48′35″N, 155°05′40″W, locally dominant on exotic trees, 20–40 m, 20 Nov 2019, A.V. Freire & E.J. Judziewicz 19-154b (BISH); same locality, 20 May 2021, A.V. Freire & E.J. Judziewicz 21-512 (BISH).

Lopholejeunea* cf. *eulopha* (Taylor) Schiffn.*New state record**

A pantropical species new to Hawaiʻi; apparently indigenous. Tentative identification by S. Robbert Gradstein, who writes (pers. comm., 7 July 2022): “The hyalodermis, the ovate-oblong leaves with rounded, entire (flat) apex, the thin-walled leaf cells, the apparently homogeneous oil bodies, the small lobule attached at the end of the keel by a single cell to the leaf lobe, the obscure lobule teeth (1–2), the rather large underleaves with rounded bases and arched insertion, all these features point to *L. eulopha*.” Perianths will be required for a positive identification (Zhu & Gradstein 2005: 18–19).

Material examined. HAWAII: Manukā N.A.R., 19°06′32–54″N, 155°48′50″–49′33″W, on southeast part of loop trail from wayside, on moist shaded rocks, 600 m, 9 Jan 2022, A.V. Freire & E.J. Judziewicz 22-57 (BISH); same population, 29 Sep 2022, A.V. Freire & E.J. Judziewicz 22-859 (BISH); on northwest part of same loop trail, 29 Sep 2022, A.V. Freire & E.J. Judziewicz 22-845c (BISH).

Marchesinia brachiata* (Sw.) Schiffn.*Name change**

Treated as *Marchesinia mittenii* A. Evans by Staples & Imada (2006). See Gradstein (2012: 73). Rare, collected by Hillebrand in the 19th century somewhere in Hawaiʻi on trees and mixed with *Lopholejeunea nigricans*. The Miami University (MU) database also lists collections from Kauaʻi (Hanakoa Valley, Nā Pali coast), Oʻahu (Kiapapau [sic] Valley, Koʻolau Range), and Hawaiʻi (Hakalau, Hāmākua coast) at elevations from 244–457 m; we have not examined them. The very deeply arched insertion of the underleaves is diagnostic. This is a common tropical American species. It should be sought in lowland rain forest.

Myriocoleopsis minutissima* subsp. *myriocarpa

(Nees & Mont.) R.L. Zhu, Y. Yu & Pócs

Name change; new synonym

Cololejeunea cookei A. Evans (Staples & Imada 2006) is a synonym of this subspecies. Indigenous, found at least on Kauaʻi, Maui and Hawaiʻi. Two subspecies of *Myriocoleopsis minutissima* occur in Hawaiʻi; see Judziewicz *et al.* (2023:22) for the new state record of *M. m.* subsp. *minutissima*, and the key below that separates the two taxa. Both subspecies (Yu *et al.* 2014) are almost cosmopolitan (Gradstein 2021: 579; Lee &

Gradstein 2021: 104). A tiny, easily overlooked bark epiphyte found in mesic to wet forests, even on exotic trees; related to *Cololejeunea*, but the lobules are much longer, near as long as the lobe.

Material examined. **KAUAI:** Lihu'e Distr, Hā'upu Ridge, secondary forest dominated by *Aleurites*, *Pandanus*, and *Psidium* with scattered *Cyrtandra*, *Hedyotis*, and *Cibotium*, east flank below Omoe, epiphytic on leaves of *Syzygium malaccense*, 520–680 m, 17 Sep 1990, T. Flynn & M. Kiehn 4243b (PTBG).

KEY TO HAWAIIAN SUBSPECIES OF *MYRIOCOLEOPSIS MINUTISSIMA*

1. Lobules broad, almost as large as the lobe, with a distinct tooth
 *M. minutissima* subsp. *minutissima*
 1'. Lobules narrow, an elongate enfolding of the lower lobe margins, with or without
 a tooth *M. minutissima* subsp. *myriocarpa*

Spruceanthus planiusculus (Mitt.)

X.Q. Shi, R.L. Zhu & Gradst.

Name change

Treated as *Archilejeunea planiuscula* (Mitt.) Steph. by Staples & Imada (2006). Indigenous; found on all major islands and Lāna'i (Judziewicz *et al.* 2023), 0–1067 m, but mostly below 600 m; see Shi *et al.* (2015: 889) and Wang *et al.* (2016).

Vitalianthus pseudoneurus (A. Evans) Judz. & A.V. Freire, **comb. nov.**

Basionym: *Harpalejeunea pseudoneura* A. Evans, *Trans. Connecticut Acad. Arts* 10: 427. 1900.

Treated as *Drepanolejeunea pseudoneura* (A. Evans) Grolle by Staples & Imada (2006).

Endemic; O'ahu (several places in both the Wai'anae and Ko'olau Ranges), Maui (Pu'u Kukui), and Hawai'i (Kūlani Road) (152–1,737 m). A distinctive species with golden brown ocelli forming a false "midvein" on the leaf. Tiny, epiphytic or epiphyllous plants appressed to the substrate, the pointed lobes with a line of golden brown ocelli running down the center. The aspect of the leaves and ocelli suggest a tiny "jester's cap." Grolle (1988: 405) postulated that its closest relative is the South American *Drepanolejeunea bischleriana* (now *Vitalianthus bischlerianus* (K.C. Pörto & Grolle) R.M. Schust. & Giancotti. See also Gradstein (2018: 8–9). Based on the key to species in Zhu *et al.* (2018), the Hawaiian species appears to be most closely related to the tropical American species *V. aphanellus* (Spruce) Bechteler, G.E. Lee, Schäf.-Verw. & Heinrichs and *V. bischlerianus* than to the tropical Asian species *V. lamyii* R.L. Zhu, L. Shu & H. Mohamed and *V. guangxianus* R.L. Zhu, Qiong He & Y.M. Wei. The Asian species have underleaves with lobes 3–4 cells wide at the base, and each lobe has a lateral tooth. The American species have underleaves with lobes two cells wide at the base and lack lateral teeth. *Vitalianthus pseudoneurus* is distinctive in the genus in its attenuate, recurved lobes (versus bluntly acute and only slightly recurved), large lobules 0.55–0.65 times as long as the lobes (versus only 0.3–0.5 times as long), and ocelli in a line 6–10 cells long (versus 3–6 cells long). The oil bodies are small (0.1 the diameter of each cell) and only 2–3 per cell.

Material examined. **O'AHU:** Wai'anae Range, trail from Mauna Kapu to Palikea, on bark of *Cryptomeria japonica*, 811–920 m, 4 Nov 2021, E.J. Judziewicz *et al.* 21-960 (BISH); Ko'olau Range, Lanihuli, anno 1902, C.M. Cooke, Jr. 27, 32 (BISH); Kalihi Valley, 9 Mar 1916, C.N. Forbes 2307.O (BISH); Mānoa Falls Trail, on spongy bark of *Eucalyptus*, 500 ft [152 m], 18 Mar 1977, Stemmermann 2023 (BISH). Also reported from Maui (Pu'u Kukui) by Miller (1963) based on L. Cranwell & C. Skottsberg 5438 (S, Stockholm herbarium, not seen), and from Hawai'i Island (Grolle 1988) from the Stainback Hwy., H.A. Miller & A. Lamberton 5198 (MU, Miami University herbarium, not seen).

KEY TO SPECIES OF *VITALIANTHUS* OF THE WORLD
(modified from Zhu *et al.* (2018) to add *V. pseudoneurus*)

1. Underleaf lobe (2–)3–4 cells wide at base; outer lateral margins of underleaf lobes toothed; tropical Asia
 2. Shoots 0.4–0.7 mm wide; leaves oblong-ovate, obliquely spreading; leaf lobules 1/3–2/5 as long as the lobes; outer lateral margin of underleaf lobes with a distinct tooth 1–2 cells long; Borneo *V. lamyii*
 2. Shoots 0.2–0.3(–0.4) mm wide; leaves ovate, almost erect; leaf lobules usually 1/2–3/4 as long as the lobes; outer lateral margin of underleaf lobes entire to angular; China *V. guangxianus*
- 1'. Underleaf lobe mostly 2(–3) cells wide at base; outer lateral margins of underleaf lobes entire or weakly angular; tropical South America and Hawai'i
 3. Leaf lobe ocelli in a row of 5–10 cells; lobule 0.55–0.65 times as long as the lobe; lobes acute-acuminate, strongly recurved; Hawai'i *V. pseudoneurus*
 - 3'. Leaf lobe ocelli in a row of 3–6 cells; lobule 0.3–0.5 times as long as the lobe; lobes obtuse to acute, divergent and only slightly if at all recurved; tropical South America
 4. Ventral margin of leaf usually arched; leaves oblong, erect to suberect, usually remote; Brazil, French Guiana, and Colombia *V. aphanellus*
 - 4'. Ventral margin of leaf usually weakly curved; leaves mostly oblong-ovate, obliquely to widely spreading, imbricate; Brazil ... *V. bischlerianus*

Lepidoziaceae

Bazzania hookeri (Lindenb.) Trevis.

New state record

Indigenous; so far known only from near the summit of Mt Ka'ala, O'ahu. The auriculate underleaves and leaves (characters found in no other Hawaiian congeners) are distinctive and match the widespread tropical American species *Bazzania hookeri* (Gradstein & Ilkiu-Borges 2009: 26–27, with illustration; Gradstein 2017, 2021: 213), but with broader triangular leaves that are about as long as wide at their base.

Material examined. O'AHU: wet embankment near the summit of Mt Ka'ala, 1,205 m, 9 Nov 2022, M.K. Thomas *et al.* 524a (BISH).

Lophocoleaceae

Cryptolophocolea bartlettii (H.A. Mill.) Judz. & A.V. Freire, **comb. nov.**

Basionym: *Lophocolea bartlettii* H.A. Mill., *Ark. Bot.*, n.s., 5: 506. 1963. Treated as *Chiloscyphus bartlettii* (H.A. Mill.) J.J. Engel & R.M. Schust. by Staples & Imada (2006).

Endemic; found on Moloka'i, Maui, and Hawai'i (1,067–1,829 m). An uncommon small species creeping on bark. Leaves are opposite to nearly so, rectangular, and slightly inrolled, apices may be variable, from round, truncate to slightly emarginate but with some leaves per plant with two small teeth at truncate apices. The small underleaves are bifid, with small lateral teeth or elbows, clearly connate to both adjacent leaves, “batlike”; the median leaf cells have conspicuous trigones. Miller (1963) illustrated *Lophocolea bartlettii* with a keeled perianth. Keeled perianths are not present in *Chiloscyphus* but occur in *Cryptolophocolea* and *Lophocolea*. The presence of trigones; opposite, inrolled leaves; underleaves strongly connate to adjacent leaves; and keeled perianth support the placement of this species in the genus *Cryptolophocolea*. Indeed, Miller (1963) noticed the similarity of this species to *Lophocolea gaudichaudii* (a synonym for *Cryptolophocolea ciliolata*).

Cryptolophocolea ciliolata (Nees) L. Söderstr.,

Crand.-Stotl., Stotler & Våña

Name change

Treated as *Chiloscyphus ciliolatus* (Nees) J.J. Engel & R.M. Schust. by Staples & Imada (2006). See Söderström *et al.* (2013: 39, 2016: 193), and Lee & Gradstein (2021: 72). Indigenous; a variable eastern Asian species, disjunct in Hawai'i (Sun *et al.* 2018: 160) and commonly found in wet forests on all major islands and Lāna'i (Judziewicz *et al.* 2023), 457–1,860 m.

Leptoscyphus baldwinii (Steph.) Judz. & A.V. Freire, **comb. nov.**

Basionym: *Lophocolea baldwinii* Steph., *Bull. Herb. Boissier*, sér. 2, 6: 950. 1906. Treated as *Chiloscyphus baldwinii* (Steph.) J.J. Engel & R.M. Schust. by Staples & Imada (2006).

Endemic; a common species on all major islands and Lāna'i (Judziewicz *et al.* 2023), 610–1,830 m; on bark, rotted wood, and moist shaded soil in wet forests. The leaves are round to squarish and the leaf margins are fringed with 8–12 spreading cilia. With age or upon drying, the plants, especially the stem, become reddish brown. The leaves usually have large trigones. The numerous leaf marginal cilia and golden brown color (with age) indicate that this species belongs to *Leptoscyphus* rather than *Chiloscyphus* or *Lophocolea*. It appears to be mostly closely related to the tropical American species *Leptoscyphus trapezoides* (Mont.) L. Söderstr. See Gradstein (2021: 251, 258–260) for a description of the latter species.

Lophocolea autoica Steph.**Name change**

Treated as *Chiloscyphus autoicus* (Steph.) J.J. Engel & R.M. Schust. by Staples & Imada (2006). See Söderström *et al.* (2016: 209). Indigenous; supposedly also found in New Caledonia (Miller *et al.* 1983). Found on O'ahu, Lāna'i (Judziewicz *et al.* 2023), and Hawai'i, 550–1,980 m; often in mesic rather than wet forests. This species is unusual in the genus in that the leaves are often variable on the same plant. Some or all can be entire, slightly retuse, or with one or two inconspicuous teeth.

Lophocolea bicuspidata Steph.**Name change**

Treated as *Chiloscyphus bicuspidatus* (Steph.) J.J. Engel & R.M. Schust. by Staples & Imada (2006). See Söderström *et al.* (2016: 209). Endemic; locally common in wet forests on Maui and Hawai'i (640–1,860 m).

Lophocolea hawaica Steph.**Name change**

Treated as *Chiloscyphus hawaicus* (Steph.) J.J. Engel & R.M. Schust. by Staples & Imada (2006). See Söderström *et al.* (2016: 211). Endemic; a common species found Kaua'i, Moloka'i, Lāna'i (Judziewicz *et al.* 2023), and Hawai'i, 488–2,133 m.

Lophocolea kilauensis (Steph.) H.A. Mill.**Name change**

Treated as *Chiloscyphus kilauensis* Steph. by Staples & Imada (2006). See Söderström *et al.* (2016: 190). Endemic; uncommon on O'ahu, Lāna'i (Judziewicz *et al.* 2023), and Hawai'i, 914–1,890 m.

Lophocolea muricata (Lehm.) Nees**Name change**

Treated as *Chiloscyphus muricatus* (Lehm.) J.J. Engel & R.M. Schust. by Staples & Imada (2006). See Söderström *et al.* (2016: 213). Indigenous; rare; known in Hawai'i from just a single collection made at Mile 23 (ca. 600–900 m) on the Hilo-Volcano Road, Hawai'i Island, in 1938 (*C. Skottsberg 5030*, Stockholm Herbarium, not examined; Miller 1963). We have unsuccessfully searched for it in the Volcano area. It may occur as a tiny epiphyte on fern fronds. It is mainly a species of tropical mountains and temperate areas of the Southern Hemisphere, with some records in warm temperate eastern Asia and North America.

Lophocolea pusilla Steph.**Confirmation of a previous tentative record**

Rare endemic, Hawai'i Island. The complete absence of leaf teeth is unusual in Hawaiian species of *Lophocolea*. Very small leaf trigones may be present. It seems possible that this species may be conspecific with *L. autoica* Steph.; if so, we suggest that it be placed in synonymy under that species. Cited as an accepted species for Hawai'i by Miller (1963) but listed as a dubious record by Staples & Imada (2006: 38) because Miller *et al.* (1983: 202) failed to cite an island locality; however, the Hawai'i Island specimen below was annotated by Miller in 1960.

Material examined. **HAWAI'I:** Haleloulou, 3 Jun 1915, *C.N. Forbes 672b* (BISH).

Lophocolea spinosa Gottsche**Name change**

Treated as *Chiloscyphus spinosus* (Gottsche) J.J. Engel & R.M. Schust. by Staples & Imada (2006). Endemic; an uncommon and inconspicuous small species found in bryophyte mixtures on O'ahu, Maui, and Hawai'i (914–1,768 m). Exquisitely delicate and often twining on other liverworts such as *Bazzania* and *Herbertus* and resembling tiny "snowflakes on a string."

Marchantiaceae***Marchantia polymorpha*** L.**New state record**

This cosmopolitan, weedy species, often found in greenhouses and nurseries, has been collected in several places in Hawai'i, but has never been reported. It is found from sea level to over 1,700 m.

Material examined. **KAUAI'I:** Puhī, Kauai Nursery and Landscaping, 3-1550 Kaumuali'i Hwy, moist soil in pots of plants imported from Florida, 109 m, 9 June 2003, *D. Lorence & C. Kaneshige 9080* (BISH, PTBG); same locality, mat-forming at base of concrete pillar, growing mixed with *Philonotis*, 100 m, 30 Aug 2016, *T. Flynn 8673* (BISH, PTBG). **O'AHU:** Honolulu Distr, Sand Island, Kilgo's Nursery on Sand Island Access Rd, growing on damp medium in a pot with variegated *Osmanthus heterophyllus*, 27 Mar 2007, *G. Staples 1301* (BISH). **MAUI:** West Maui, valleys, damp ground, 800 ft [244 m], 1875, *D.D. Baldwin 88, 90* (BISH); East Maui, Makawao Distr, Kēōkea, Kula Forest Reserve, 5,600 ft [1,707 m], in dense shade on cinder/ash substrate, under forestry plantings of conifers, recently burned, 1 Sep 2009, *H.K. Oppenheimer H90202* (BISH). **HAWAI'I:** Up 1880 lava flow to Kaūmana Caves, 21 May 1915, *C.N. Forbes 596H* (BISH); Volcano, 11-3733 Ala 'Ōhi'a St, Volcano Guest House, 19°25'53"N, 155°16'49"W, cracks in paving stones near house, 1,045 m, 5 Nov 2019, *A.V. Freire & E.J. Judziewicz 19-113* (BISH); South Hilo Distr, Waiākea Uka, 142-A Mala'ai Rd, in Novelty Greens nursery, in shade beneath tree ferns, growing on wet black weed block cloth spread on ground, 300 m, 17 Jan 2007, *G. Staples & E. Wilson 1239* (BISH).

Plagiochilaceae***Chiastocaulon combinatum* (Mitt.)**

S.D.F. Patzak, M.A.M. Renner,

Schäf.-Verw. & Heinrichs

Name change

Treated as *Plagiochilon combinatum* (Mitt.) Inoue by Staples & Imada (2006). See Patzak *et al.* (2016: 492) and Söderström *et al.* (2016: 252). Endemic; found on all major islands and Lānaʻi (Judziewicz *et al.* 2023), 213–1,676 m, in wet forests.

Plagiochila caduciloba* H.L. Blomq.*New state record**

Indigenous; apparently found only on Hawaiʻi Island, where we collected it recently in a wet montane forest in the Kāhuku Unit of Hawaii Volcanoes National Park. This is the first report of this southern Appalachian, U.S. species from Hawaiʻi. Other disjuncts with this Appalachians-Hawaiʻi disjunct pattern are known, for example *Radula sullivantii* (So 2005) and the moss *Plagiomnium rhynchophorum* (Harv.) T.J. Kop. (Wyatt *et al.* 2021). In its lack of trigones, caducous leaves, and large teeth this species resembles *P. remyana* (this paper), but the leaves of *P. caduciloba* are more deeply lobed than in the former species, and the plant lacks top-heavy branching. Not treated by Inoue (1976) in his revision of Hawaiian species of *Plagiochila*.

Material examined. **HAWAII:** Hawaii Volcanoes National Park, Kāhuku Unit, kīpuka near CCC/TMA cabin, 19°14'46–52"N, 155°36'02–22"W, 1,860 m, 10 Aug 2022, *A.V. Freire & E.J. Judziewicz 22-720a* (HAVO).

Plagiochila cf. corticola* Steph.*New state record**

A collection from a wet, exotic, lowland forest closely resembles this tropical Asian species (Grolle & So 2000: 9). We are not certain whether it is indigenous or naturalized. The leaves are nearly all consistently bifid (a few trifid) and have no trigones. Tiny underleaves are present. Not treated by Inoue (1976) in his revision of Hawaiian species of *Plagiochila*.

Material examined. **HAWAII:** Onomea, 19°48'35"N, 155°05'40"W, on exotic trees, 23–46 m, 20 May 2021, *A.V. Freire & E.J. Judziewicz 21-515* (BISH).

Scapaniaceae***Isopaches bicrenatus* (Schmidel ex Hoffm.)**

H. Buch

New state record

Indigenous; this is a drought-tolerant leafy liverwort, often found with *Cephaloziella heteroica* from 762–2,133 m and possibly higher. First collected (and long filed as a *Cephaloziella*) by J. Sorenson (*Sorenson H-18*) on 10 May 1979 at the Puhimau Hot Spot [ca. 1,100 m] in Hawaii Volcanoes National Park (BISH). This is the first record of this Holarctic genus (and species) between the Americas and New Zealand; there are also scattered records from South America (Gradstein 2021: 330–331). The plants have a distinctive and penetrating odor of cedar oil. Gemmae are sometimes observed at tips of plants; they are, brown, quadrate to star-shaped. In addition to numerous sites on Mauna Loa, we have also found it on Mauna Kea and Maui, where found at 2,400 m elevation.

Material examined. **MAUI:** Haleakalā National Park, Halemauʻu Trail, 20°45'15"N, 156°13'30"W, 2,400 m, in *Leptecophyllum* shrubland, 24 Feb 2023, sight record by A.V. Freire, E.J. Judziewicz, and Z. Pezzillo (see Fig. 1). **HAWAII:** Kaʻū Desert, 19°21'05"N, 155°22'00"W, shaded embankment, on moist ash, 880 m, 12 Jan 2020, *A.V. Freire & E.J. Judziewicz 20-13* (HAVO); Lava Molds spur, 19°25'53"N,

155°17'03"W, shaded embankment, on moist ash, 1,233 m, 13 Jan 2020, *A.V. Freire & E.J. Judziewicz 20-15* (HAVO); same location, 9 Sep 2020, *A.V. Freire & E.J. Judziewicz 20-644* (HAVO); Hilina Pali Rd ca 0.6 mi SW of Kīpuka Nēnē, 19°19'22"N, 155°17'04"W, moist cracks in rocks, 870 m, *A.V. Freire & E.J. Judziewicz 20-38, 20-39, 20-40, 20-41* (HAVO); Maunaulu parking lot, 19°21'57"N, 155°13'08"W, soil-filled roadside crevice, 988 m, 6 Mar 2021, *A.V. Freire & E.J. Judziewicz 21-308a* (HAVO); summit of Mauna Loa Rd, 19°29'46"N, 155°23'01"W, locally abundant on ashy soil in partial shade, 2,050 m, 4 Apr 2021, *A.V. Freire & E.J. Judziewicz 21-392* (HAVO); 50 m E of Volcano House, 19°25'40"N, 155°15'40"W, in rainforest on trailside ash embankment, 1,210 m, 7 Apr 2021, *A.V. Freire & E.J. Judziewicz 21-402, 21-406* (HAVO); Kāhuku Unit, from Upper Palm trailhead north towards pit crater, trailside soil, 19°06'13"N, 155°41'17"W, 960 m, *A.V. Freire & E.J. Judziewicz 21-218* (HAVO); Kāhuku Unit, base of sedges at edges of small waterholes, 19°13'36"N, 155°38'00"W, 1,875 m, *A.V. Freire & E.J. Judziewicz 22-675* (HAVO); Kāhuku Unit, moist ash soil at edge of gulch 300 m NE of Nēnē Cabin, in open *Leptecophyllum* scrub, 19°15'30"N, 155°36'43"W, 2,000 m, *A.V. Freire & E.J. Judziewicz 22-690c, 22-691a* (HAVO); Hwy 11 roadside at Mile 40, 19°20'50"N, 155°23'14"W, tiny soil pocket in basalt, 860 m, 10 Mar 2021, *A.V. Freire & E.J. Judziewicz 21-335* (BISH); Mauna Kea, Mānā Rd at Wailuku River crossing, 19°46'12"N, 155°21'50"W, 2,085 m, 26 Mar 2023, *A.V. Freire & E.J. Judziewicz 23-328* (BISH); Hakalau Forest National Wildlife Refuge, embankment on entrance road, near Honohina Gulch, 19°49'12"N, 155°19'57"W, 1,965 m, 24 Mar 2023, *A.V. Freire & E.J. Judziewicz 23-213* (BISH); Hakalau Forest National Wildlife Refuge, near 'Āwehi Gulch, in full sun on rock at old quarry site, 19°47'15"N, 155°19'15"W, 1,815 m, 26 Mar 2023, *A.V. Freire & E.J. Judziewicz 23-235* (BISH).



Figure 1. *Isopaches bicrenatus*. Maui, Haleakalā National Park, Halemau'u Trail, 24 February 2023. Photo: Zachary Pezzillo.

Lophozia silvicola* H. Buch*New state record**

Identification of this widespread Eurasian and North American species by authority Nadezhda A. Konstantinova (pers. comm.). Indigenous; usually terrestrial in moist high elevation forests on Maui and Hawai'i. On the latter it occurs from Mauna Loa from the Saddle Road to the Upper Kāhuku Unit of Hawaii Volcanoes National Park, (1,672–2,445 m), and also on the eastern slopes of Mauna Kea. Often growing with *Tritomaria exsecta*; both species are dispersed by gemmae, suggesting long-distance dispersal by birds from northern Eurasia or North America.

Material examined. **MAUI:** Haleakalā, N slope of Kalapawili Ridge, E of Lau'ulu Trail in *Deschampsia* grassland with scattered *Hypochaeris*, on shaded base of grass clump, 8,020 ft [2,445 m], 8 Jun 1977, *Hoe 4554.0* [mixed with *Symphygyna* and *Calypogeia tozana*] (BISH). **HAWAI'I:** Hawaii Volcanoes National Park, Upper Kāhuku Unit, 19°11'34"N, 155°39'35"W, kīpuka on south side of road, 1,672 m, 9 Aug 2022, *A.V. Freire & E.J. Judziewicz 22-655a, 667* (HAVO); near waterholes, shaded rock crevice, 19°13'36"N, 155°38'00"W, 1,864 m, 9 Aug 2022, *A.V. Freire & E.J. Judziewicz 22-676, 686^a* (HAVO); kīpuka near CCC/TMA cabin, 19°14'46–52"N, 155°36'02–22"W, 1,852–1,885 m, 10 Aug 2022, *A.V. Freire & E.J. Judziewicz 22-715a, 723c, 728a, 763a* (HAVO); Hakalau Forest National Wildlife Refuge, 'Āwehi Gulch, 19°47'15"N, 19°47'15"W, 1,830 m, 26 Mar 2023, *A.V. Freire & E.J. Judziewicz 23-238* (BISH).

***Protolophozia perssoniana* (H.A. Mill.)**

Váňa & L. Söderstr.

Name change

Treated as *Lophozia perssoniana* H.A. Mill. by Staples & Imada (2006). See Váňa *et al.* (2013b: 52). One of the few endemic liverworts of Maui Nui, it is rarely found in montane bogs on Moloka'i and Maui (1,220–1,737 m), where it grows mixed with the sedge *Oreobolus furcatus* H. Mann (Miller 1963). The genus has both boreal and austral affinities.

Scapania ciliata* Sande Lac. subsp. *hawaiiica

(Müll. Frib.) Potemkin

Name change

Treated as *Scapania hawaiiica* Müll. Frib. (Scapaniaceae) by Staples & Imada (2006). See Potemkin (2002: 321) and Söderström *et al.* (2016: 88). An endemic subspecies found on Kaua'i and Maui (762–2,435 m).

Scapania javanica* Gottsche*Name change**

Treated as *Scapania paucidens* Steph. by Staples & Imada (2006). See Potemkin (2002) and Söderström *et al.* (2016: 92). Indigenous; pantropical; found on Moloka'i and Hawai'i (610–1,768 m).

Scapania ornithopoides* (With.) Waddell*Correction**

Treated as *Scapania ornithopodioides* (With.) Waddell by Staples & Imada (2006). Indigenous; rare, Maui (both West Maui and Haleakalā; 1,128–2,255 m). An Asian and Malesian species that is disjunct in Hawai'i (Sun *et al.* 2018: 160). The specific epithet is sometimes spelled as *ornithopodioides*, but that spelling was not conserved (Klazenga 2017).

Scapania verrucosa* Heeg*Name change**

Treated as *Scapania mauiana* [as *mauina*] Steph. by Staples & Imada (2006). See Potemkin (2002) and Söderström *et al.* (2016: 92). Indigenous; found on Maui (914–1,830 m); otherwise Eurasian.

***Sphenolobus minutus* (D. Crantz) Berggr. New state record**

Indigenous; in Hawai‘i, only on Haleakalā, Maui (2,362–2,444 m). First collected there by D.D. Baldwin (*Baldwin 65*, in 1875); then in 1977 by William J. Hoe in *Deschampsia* grassland on Kalapawili Ridge, Haleakalā, Maui; then on damp dirt beneath boulders on the Halemau‘u Trail by Marko Lewis in 1981. This is a common Holarctic species that is also present at scattered locations in tropical regions. It is a small plant resembling *Anastrophyllum* but is greenish in color; has more distant, cupped, almost tubular leaves; and lacks large trigones (Lee & Gradstein 2021: 82–83, 189). It grows in dense mats and can reproduce by leaf gemmae, suggesting long-distance dispersal by migratory birds.

Material examined. MAUI: Haleakalā, anno 1875, *D. Baldwin 65* (BISH); N slope of Kalapawili Ridge, E of Lau‘ulu Trail in *Deschampsia* grassland with scattered *Hypochaeris*, on shaded base of grass clump, 8,020 ft [2,444 m], 8 Jun 1977, *Hoe 4555.0* (BISH) [mixed with *Lophozia silvicola*]; Halemau‘u Trail, on damp dirt beneath boulders, 7,750 ft [2,362 m], 4 Oct 1981, *M. Lewis 81-247* (BISH, F).

***Tritomaria exsecta* (Schmidel) Loeske New state record**

Indigenous; rare, usually terrestrial in moist high elevation forests on Mauna Loa on Hawai‘i Island (1,646–1,890 m), from the Saddle Road kīpuka (including Pu‘u Maka‘ala N.A.R., where collected in 1978 by *Murakami s.n.*, BISH 706366) clockwise to the Upper Kāhuku Unit of Hawaii Volcanoes National Park. Widespread on the mainland in Russia, Alaska, Canada, and the northern United States (Lee & Gradstein 2021: 84, 190). A distinctive small terrestrial species with 3-lobed leaves and elliptical gemmae; often associated with *Lophozia silvicola*.

Material examined. HAWAII: Kīlauea Forest Reserve [now Pu‘u Maka‘ala N.A.R.], on fallen log, with *Scapania javanica*, 1,646 m, 18 Aug 1978, *G. Murakami s.n.* (BISH 706366); Hawaii Volcanoes National Park, Kāhuku Unit, 19°11'34"N, 155°39'35"W, kīpuka on south side of road, 1,672 m, 9 Aug 2022, *A.V. Freire & E.J. Judziewicz 22-645a, 653* (HAVO); near waterholes, shaded rock crevice, 19°13'36"N, 155°38'00"W, 1,864 m, 9 Aug 2022, *A.V. Freire & E.J. Judziewicz 22-683* (HAVO); kīpuka near CCC/TMA cabin, 19°14'46–52"N, 155°36'02–22"W, 1,831–1,885 m, 10 Aug 2022, *A.V. Freire & E.J. Judziewicz 22-698b, 715b, 729a, 730a* (HAVO).

Schistochilaceae***Schistochila cookei* (H.A. Mill.) R.M. Schust. Name change**

Treated as *Fulfordistria cookei* H.A. Mill. by Staples & Imada (2006). See Miller (1970: 320) and Schuster (1971: 628). Endemic; collected once on (apparently) Moloka‘i in September 1903 by C.M. Cooke, Jr. (perhaps in the Pēpē‘ōpae bog, ca. 1,000 m?). There is reportedly a specimen at BISH but we have not seen it. It is a striking liverwort: large (5–7 mm wide) and with numerous raised, toothed ridges (lamellae) running lengthwise along the conduplicate leaves. *Schistochila* is an Austral and tropical Asian genus. Possible affinity (Miller 1970): *S. lamellata* (Hook.) A. Evans, Chile.

Solenostomataceae***Solenostoma exsertum* (A. Evans) Steph. Name change**

Treated as *Jungermannia hawaïica* (H.A. Mill.) Váňa by Staples & Imada (2006). See Söderström *et al.* (2016). Endemic; occasional; found on all major islands (305–1,859 m). Miller (1963) treated it as *Solenostoma hawaïicum* H.A. Mill.

***Solenostoma micranthum* (Mitt.)**

Váña, Hentschel & Heinrichs

Name change

Treated as *Jungermannia micrantha* (Mitt.) Steph. by Staples & Imada (2006). See Váña *et al.* (2010). Indigenous; this variable, medium-sized leafy liverwort grows on all major islands and Lānaʻi (Judziewicz *et al.* 2023), 0–2,591 m, and is also found in Sāmoa.

Southbyaceae***Southbya organensis* Herzog****Name change**

Treated as *Southbya grollei* N. Kitag. by Staples & Imada (2006). See Váña *et al.* (2012) and Lee & Gradstein (2021: 85). Indigenous; rare, Kahālāwai, Maui; H.A. Miller (unpublished) also reports it from Kauaʻi, Oʻahu, and Molokaʻi (1,097–1,737 m). Gradstein (2018: 8) maps it as occurring in Brazil, Peru, Sri Lanka, Hawaiʻi, Southeast Asia, and New Guinea.

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