

New records of introduced Lepidoptera in the Hawaiian Islands for the year 2022

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Seven new state records and eighteen new island records are reported for introduced Lepidoptera in Hawai'i. Two new species-level identifications, one new correction to a previous identification, and five name changes are noted. Corrections and additions to the lists in Austin & Rubinoff (2022) are provided.

Information regarding the formerly published distributions in Hawai'i of species discussed herein is based on Nishida (2002), Starr *et al.* (2004), Howarth *et al.* (2012), and Austin & Rubinoff (2022). Identifications were made by the first author except where otherwise noted. Label data was transcribed verbatim except for corrections to Hawaiian spelling and orthography. Any other corrections to data labels are provided in brackets following the verbatim label. Atypical coordinates are presented verbatim but more conventional coordinates are provided in brackets. Identifications were based on external morphology, genitalia dissections, and cytochrome oxidase I sequence data (COI barcode; GenBank accession numbers provided). COI sequence data, including data from Austin & Rubinoff (2022), is available as a BOLD dataset (DOI: <https://dx.doi.org/10.5883/DS-IHLCR>). Specimens were compared with illustrations and figures in the published literature as well as through comparisons with material deposited at the Bernice Pauahi Bishop Museum (BPBM), Hawaii Department of Agriculture (HDOA), and the University of Hawai'i Insect Museum, University of Hawai'i at Mānoa (UHIM). Voucher specimens and other examined material are deposited in these collections as noted.

Blastobasidae

Blastobasis inana (Butler)

New island record

This species was previously reported from Hawai'i Island, Lāna'i, and O'ahu by Nishida (2002) and Kaua'i by Austin & Rubinoff (2022). We report it from Maui for the first time.

Material examined. **Maui:** 1♀, Makawao F[orest] R[eserve], lower Māliko Gulch, top of cliff, 20.8400, -156.2761, 715 m, 25–25 Oct 2022, K.A. Austin, UV bucket trap (UHIM).

Pigritia sp. A

New state record

This is the second species of *Pigritia* known from Hawai'i. A 658-bp fragment of COI (GenBank Accession #OQ174441) does not match any sequenced species. All described species of *Pigritia* are known from the Americas, except for *Pigritia uuku* Adamski, 2012, only known from Kaho'olawe (Medeiros & Adamski 2012), but considered questionably native by Austin & Rubinoff (2022). We consider *Pigritia* sp. A introduced.

Material examined. **O'ahu:** 1♀, Honolulu, 2620A Nahaku Place, 21.2869, -157.8197, 19 Jan 2022, K.A. Austin, at porch light / DNA extraction KA0456 / KAA diss[ection] #0713 (UHIM).

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Crambidae***Paraponyx fluctuosalis*** (Meyrick)**New island record**

This species was previously recorded from Kauaʻi, Oʻahu, and Maui (Nishida 2002). We report it from Hawaiʻi Island for the first time.

Material examined. **Hawaiʻi:** 2♀♀, S[outh] Hilo, Onomea, 3,000 ft [914 m], koa, 13 Jan 2002, S.L. Montgomery, MV light (BPBM).

Dryadaulidae***Dryadula advena*** (Zimmerman)**New island records**

Zimmerman (1978) treated this species as introduced and until now was only known from Oʻahu. We report it from Kauaʻi and Maui for the first time. It has not been reported from outside of Hawaiʻi.

Material examined. **Kauaʻi:** 1♀, Haleleʻa F[orest] R[eserve], Upper Hanalei Valley, along Hanalei River, 265 m, 22.1018, -159.4647, 26–27 May 2022, K.A. Austin, J.B. Reil, UVLED light sheet (UHIM). **Maui:** Makawao Forest Res[erve], Site 5, NAD83 04Q 784191 2306032 [20.83261, -156.269334], 945 m, 23–24 Mar 2005, W. Haines, UV light trap (BPBM).

Euteliidae***Penicillaria jocosatrix*** Guenée**New island record**

This species was previously recorded from Kauaʻi, Oʻahu, Maui, Lānaʻi, and Hawaiʻi Island (Nishida 2002). We report it from Molokaʻi for the first time.

Material examined. **Molokaʻi:** 1♂, Puʻu Kolekole, Sep 1996, M. Heddle, S. Loo (BPBM).

Geometridae***Chloroclystis pyrrollopha*** Turner**Name change & new island record**

This species was first reported in Hawaiʻi as *Chloroclystis* sp. A by Austin & Rubinoff (2022). A 658-bp fragment of COI sequenced from an Oʻahu specimen (GenBank Accession #OQ174430) is a 99.4% pairwise distance match to *Chloroclystis pyrrollopha* Turner (GenBank Accession #JN273935.1), a species native to Queensland, Australia. We report it from Kauaʻi for the first time.

Material examined. **Kauaʻi:** 1♂, Kōkeʻe State Park, Awaʻawapuhi Trail, 22.1468, -159.6605, 1110 m, 21–22 Mar 2022, K.A. Austin, LED bucket trap (UHIM).

Pleuroprucha asthenaria (Walker)**Name change**

This species was first reported in Hawaiʻi as Geometridae “undetermined genus sp. A” by Matsunaga *et al.* (2019). Austin & Rubinoff (2022) identified it as *Pleuroprucha* sp. A. A 658-bp fragment of COI of an Oʻahu specimen (GenBank Accession #OQ174442) is a 99.7% pairwise distance match to *Pleuroprucha asthenaria* (Walker) (GenBank Accession #JQ571256.1). It is known from Kauaʻi, Oʻahu, and Maui (Austin & Rubinoff 2022). Its native range includes the southern United States, Central America, South America, and the Caribbean.

Heliodinidae***Aetole prenticei*** Hsu**New state record**

This represents the first record of Heliodinidae in Hawaiʻi; Frank Hsu confirmed our identification. Nishida (2002) listed the purposely introduced *Rubus* biocontrol *Schreckensteinia festaliella* in Heliodinidae, but it is currently placed in its own family

and superfamily (see Austin & Rubinoff 2022). *Aetola prenticei* belongs to the *bella* group of species, all of which develop as leaf miners or in cecidomyiid galls on Portulacaceae and Aizoaceae (Hsu & Powell, 2004). *Aetola prenticei* is a specialist on *Sesuvium verrucosum* Raf. (Aizoaceae), which is naturalized on O‘ahu, Moloka‘i, Maui (Imada 2019), and possibly Kaua‘i (KISC 2018). Larvae could also potentially utilize the indigenous *Sesuvium portulacastrum* (L.) L. *Aetole prenticei* is known to natively occur in California, Arizona, and New Mexico (Hsu & Powell 2004).

Material examined. **O‘ahu:** 1♂, 1♀, Barbers Point, 5 ft [1.5 m], 30 Jan 1994, W.D. Perreira / collected sweeping beach *Portulaca* (BPBM).

Lycaenidae

Brephidium exilis (Boisduval)

New island record

This species was previously known from Kaua‘i, O‘ahu, Maui, and Kaho‘olawe (Nishida 2002; Starr *et al.* 2004; Howarth *et al.* 2012). We report it from Lāna‘i for the first time. It likely occurs on all of the main Hawaiian Islands.

Material examined. **Lāna‘i:** 2♂♂, 1♀, Kalakala, 17 Aug 1998, G.M. Nishida (BPBM).

Noctuidae

Argyrogramma verruca (Fabricius)

New island record

This species was first reported in Hawai‘i from O‘ahu and Hawai‘i Island by Austin & Rubinoff (2022). We report it here from Maui for the first time.

Material examined. **Maui:** 1♂, Makawao Forest Reserve, 945 m, Site 5, UV light trap, 23–24 Mar 2005, W. Haines, NAD83 784191 2306032 [20.832610, -156.269334] (BPBM).

Nymphalidae

Agraulis incarnata (Riley)

Name change

Agraulis vanillae (Linnaeus) has recently been recognized as a species complex distributed throughout the Neotropics and adjacent temperate regions (Zhang *et al.* 2020; Núñez *et al.* 2022). Based on the keys and figures in Núñez *et al.* (2022), the taxon present in Hawai‘i is *Agraulis incarnata* (Riley), which is widely distributed in the southern United States and Central America. True *A. vanillae* is restricted to Panama, northern South America, and parts of the Lesser Antilles (Núñez *et al.* 2022).

Plutellidae

Plutella xylostella (Linnaeus)

New island record

This global pest of cruciferous crops was previously reported from all of the main Hawaiian Islands except for Ni‘ihau and Kaho‘olawe as well Kure, Midway, Pearl & Hermes, and Laysan by Nishida (2002). We report it from Kaho‘olawe for the first time.

Material examined. **Kaho‘olawe:** 1♀, Moaulanui, 3 Mar 2013 (UHIM). 1♀, Pu‘u Moaulanui, 7 Mar 2013 (UHIM).

Pterophoridae

Diacrotricha fasciola (Zeller)

New state record

Larvae of this species were found attacking young leaves and growing tips of starfruit (*Averrhoa carambola* L., Oxalidaceae) at a University of Hawai‘i at Hilo greenhouse as well as trees outside the greenhouse. Material was sent to Mike Melzer (UHM-CTAHR) for COI barcoding and M. Alma Solis (USDA-SEL) for morphological examination. Both confirmed the identification.

Material examined. Hawai'i: 8 specimens, sex undetermined, Hilo, UH Hilo Farm, 19.652107, -155.049920, 20 Jan 2022, ex. *Averrhoa carambola* growing tips, S. Chun / #2022-020 (HDOA).

Hellinsia beneficus (Yano & Heppner)

Name change & new island record

This species was first released in Hawai'i in 1973 for control of *Ageratina riparia* (Regel) R.M.King & H.Rob. (Asteraceae) and is listed as present on O'ahu, Maui, and Hawai'i Island (Nishida 2002). Originally described in *Oidaematophorus* Wallengren, this species was listed as *Leioptilus beneficus* (Yano & Heppner) in Nishida (2002). Gielis (2011) treated it as *Hellinsia beneficus*, which was overlooked by Austin & Rubinoff (2022). We report it from Kaua'i for the first time but can find no records of deliberate releases on that island.

Material examined. Kaua'i: 1♂, Halele'a F[orest] R[eserve], Upper Hanalei Valley, along Hanalei River, 265 m, 22.1018, -159.4647, 26–27 May 2022, K.A. Austin, J.B. Reil, UVLED light sheet (UHIM).

Lioptilodes albistriolatus (Zeller)

Name change

This species was preliminarily identified as *Lioptilodes* cf. *parvus* by Howarth *et al.* (2012). *Lioptilodes parvus* (Walsingham) was treated as a synonym of *Lioptilodes albistriolatus* (Zeller) by Gielis (2011). We provisionally agree with the identification of Howarth *et al.* (2012) but correct the name to reflect the current accepted taxonomy.

Oecophoridae

“*Leptocroca*” sp. A

New state record

This species was commonly netted during the day by the authors around the Hosmer Grove Campground parking lot and along the initial portions of the trail leading to the Waikamoi Preserve flying low along the ground and even landing on vehicles. Male genitalia closely resemble some New Zealand species of *Leptocroca sensu* Philpott 1926 such as *Leptocroca vacua* Philpott. Common (2000) wrote that the New Zealand species currently placed in *Leptocroca* likely “belong to another, probably undescribed, genus of the *Barea* group.” According to Common (2000), “the larvae of the great majority of the *Barea* group feed on dead leaf litter from trees belonging to the family Myrtaceae, especially *Eucalyptus*.” Hosmer Grove contains large swaths of *Eucalyptus* that were planted in the early 20th century as part of experimental forestry plots. It is unclear if these moths were introduced at the time of importation and planting of these *Eucalyptus* trees or were accidentally introduced at a later date.

Material examined. Maui: 1♂, 7♀, Haleakalā N[at]ional P[ark], Hosmer Grove parking lot, 20.7683, -156.2381, 2041 m, 3–5 Jun 2022, K.A. Austin, D. Rubinoff, hand collecting (UHIM). 1♂, 3♀, Haleakalā N[at]ional P[ark], trail to T[he] N[at]ure C[onservancy] Waikamoi Preserve boardwalk, 20.7744, -156.2338, 1967 m, 3–5 Jun 2022, K.A. Austin, D. Rubinoff, hand collecting / DNA extraction KA0716 / KAA diss[ection] #0947 (♂) (UHIM).

Pyralidae

Assara albicostalis Walker

New island record

This species was first reported in Hawai'i from O'ahu from specimens identified by Dr. Klaus Sattler (Howarth & Sattler 1982). However, specimens more closely resemble *A. seminivale* (Turner), the macadamia kernel grub, a significant pest of macadamia in Australia and also found elsewhere in the Pacific. Dissection of male and female genitalia revealed subtle differences to those illustrated in Horak (1994), primarily in the shape of the sclerite on the male eighth sternite; a species-level identification may require DNA.

Because the species present in Hawai'i is currently known as *A. albicostalis*, we use this name for the present, but suggest that this identification may need to be examined more carefully. We report it from Hawai'i Island for the first time.

Material examined. Hawai'i: 8♂♂, 14♀♀, Kainaliu, UH Exp[erimen]t[al] Station, 12 Apr [19]90, ex. macadamia husk, L. Caprio (UHIM). 1♂, 1♀, same as previous except 22 May 1990 / ex. macadamia sticklight (UHIM).

Cryptoblabes adoceta Turner

Correction & new island record

A 658-bp fragment of COI of an O'ahu specimen (GenBank Accession #OQ174432) is a 99.8% pairwise distance match to the Australian species *Cryptoblabes adoceta* Turner (GenBank Accession #KF396907.1), commonly known as the sorghum head moth, and only a 93.0% match to the Palearctic but widely introduced species *C. gnidiella* (Millière) (GenBank Accession #MG895658.1). The same specimen (a female, KAA diss. #0633, in UHIM) lacks the two scobinate cups on the wall of the corpus bursae which are present in *C. gnidiella* (Neunzig, 1986). *Cryptoblabes aliena* Swezey, described from Hawai'i and later synonymized with *C. gnidiella* by Zimmerman (1972), may actually be a synonym of *C. adoceta* Turner. We suggest treating all previous records of *Cryptoblabes gnidiella* (Millière) and *C. aliena* Swezey in Hawai'i as misidentifications of *C. adoceta* Turner. This species had previously been reported as such from Kaua'i, O'ahu, and Hawai'i Island (Nishida 2002). In addition to these islands, we report it from Maui for the first time.

Material examined. Maui: 1♂, Makawao F[orest] R[eserve], edge of gulch nr. Fong Ridge Road, 20.8192, -156.2688, 1035 m, 24–25 Oct 2022, K.A. Austin, UV bucket trap (UHIM). 1♂, Makawao F[orest] R[eserve], lower Māliko Gulch, base of cliff, 20.8400, -156.2762, 705 m, 25–26 Oct 2022, K.A. Austin, UV bucket trap (UHIM).

Ectomyelois ceratoniae (Zeller)

New island record

This species has previously been reported from Kaua'i and O'ahu (Nishida 2002). We report it from Hawai'i Island for the first time.

Material examined. Hawai'i: 1♀, Ocean View, Maile Drive, 560 m, 19.0744, -155.7585, 17–19 Mar 2021, D. Rubinoff, C. Dooreenweerd, K. Austin, R. Rubinoff, MV light (UHIM).

Ephesiodes gilvescentella Ragonot

New island records

This species has been reported from O'ahu, Moloka'i, and Maui (Nishida 2002). We report it from Kaua'i and Kaho'olawe for the first time.

Material examined. Kaua'i: 1♂, Na Pali-Kona For[est] Res[erve], Koai'e Valley, nr. Piwa Enclosure Area, 22.1007, -159.6103, 565 m, 12–13 Oct 2021, K.A. Austin, LED bucket trap (UHIM). 1♂, same as previous except 22.1000, -159.6111 (UHIM). **Kaho'olawe:** 2♂♂, planted *Erythrina* grove nr. Luamakika, 20.55715, -156.57303, 6 Mar 2013, W. Haines & D. Rubinoff, UV bucket trap (UHIM).

Trachylepidia fructicassella Ragonot

New island record

This species was first reported in Hawai'i from O'ahu in 2021 by Austin & Rubinoff (2022). We report it from Moloka'i and Maui for the first time.

Material examined. Moloka'i: 11 adult specimens in ethanol, sex undetermined, Kaluakoi Villas, nr. Kepuhi Beach, 21.1871, -157.2450, 20 m, pods coll. 26 Dec 2022, adults ecl. 26–31 Dec 2022, K. Faccenda / HOST: *Cassia* sp. (Fabaceae), feeding in seedpods fallen on ground (UHIM). **Maui:** 7♂♂, 11♀♀, Paia, Maui Invasive Species Committee (MISC) Bunkhouse, 20.9152, -156.3475, 95 m, pods coll. 26 Oct, adult ecl[osed] 26 Oct – 30 Nov 2022, K.A. Austin / HOST: *Cassia* sp. (Fabaceae), feeding in seedpods fallen on ground (UHIM).

Tineidae***Oinophila v-flava*** (Haworth)**New island record**

This species was previously only reported from Hawai‘i Island (Nishida 2002). We report it from O‘ahu for the first time.

Material examined: **O‘ahu:** 1♀, Round Top For[est] Res[erve], Mānoa Cliff Restoration Area, 21.3379, -157.8106, 555 m, 26–27 Nov 2021, K. A. Austin, K. Faccenda, LED bucket trap (UHIM).

Tortricidae***Grapholita* nr. *mesoscia*** Diakonoff**New state record**

Adults of this species were found in a residential area of Honolulu in close proximity to an ornamental *Ochna thomasi* Engl. & Gilg (Ochnaceae) shrub. An egg mass was also discovered on a leaf of the same plant. Because females lack the orange hindwings of *Grapholita mesoscia* Diakonoff, this species likely belongs to a species complex near *G. mesoscia*, members of which are undescribed (Brown *et al.* 2014). All members of this species complex are associated with Ochnaceae in eastern Africa and the Seychelles (Brown *et al.* 2014), but have not been reported as introduced elsewhere to our knowledge. Given the gaudy colors of the adults, it seems unlikely that it has gone unnoticed for a long period of time. A more precise identification will require a careful taxonomic revision of the species complex.

Material examined: **O‘ahu:** 1♀, Kaimukī, 1237 Palolo Ave., 22.2616, -157.8111, 30 m, 4 Feb 2022, B. Rentz, resting on *Ochna thomasi* shrub in yard (UHIM). 3♀♀, same as previous except 9 Feb 2022 (UHIM).

Platynota rostrana (Walker)**New state record & correction**

This species has been previously confused with *Platynota stultana* Walsingham in Hawai‘i. However, *P. rostrana* is a much larger species with males that possess complex scaling on the frons and a long, well-developed costal fold. It is known from the southern United States, through much of Central America and the Caribbean (Powell & Brown 2012).

In Hawai‘i, it has been collected on Kaua‘i and O‘ahu and reared from a wide variety of native and non-native plants. Because of the numerous collections of this species on O‘ahu in recent years, we only list a select few records for it, primarily new or noteworthy host records. It has been collected all over O‘ahu, from close to sea level up to 870 m in elevation and occurs in both the Wai‘anae and Ko‘olau Ranges.

The record of *P. stultana* from Kaua‘i in Austin & Rubinoff (2022) was based on a misidentification of *P. rostrana*. *Platynota stultana* is not yet known to occur on Kaua‘i. The other new island records of *P. stultana* in Austin & Rubinoff (2022) are correct.

Material examined. **Kaua‘i:** 1♀, Nā Pali-Kona For[est] Res[erve], Koai‘e Valley, nr. Piwa Enclosure Area, 22.0982, -159.6115, 550 m, 12–13 Oct 2021, K.A. Austin, UVLED light sheet (UHIM). **O‘ahu:** 2♀, Diamond Head State Monument, 22.2616, -157.8111, 135 m; larva coll[ected] 14 Jan 2022, adult ecl[osed] 3 Feb 2022, K.A. Austin, K. Faccenda / HOST: *Santalum album* (Santalaceae), leaf-tier (UHIM). 1♀, Dan Rubinoff’s Yard, Mānoa, larva coll. 30 Sep, pupa 7 Oct, adult 14 Oct 2021, D. Rubinoff / HOST: *Bidens torta* (Asteraceae), leaf-tier (UHIM). 1♀, LCC Pearl City Garden, reared ex. *Flu[e]ggea neofawraea*, coll. 17 Nov 2015, pup. 30 Nov 2015, emerged 6 Dec 2015 (UHIM). 1♀, Schofield Barracks, Army Natural Resource Program (ANRP) greenhouse, reared ex. *Nototrichium humile*, feeding on leaves, coll. 8 Nov 2015, emerged 7 Dec 2015, K. Magnacca (UHIM). 1♀, Pia Valley Restoration area, 21.2973, -157.7420, 100 m, pupa coll. 23 Oct 2021, adult ecl. 31 Oct 2021, K.A. Austin, K. Faccenda / HOST: pupa on *Senna pendula* (Fabaceae), no feeding damage noticed (UHIM). 1 pupa, Honouliuli For[est] Res[erve], Pu‘u Hāpapa, near snail jail, 21.4670, 158.1030, 810 m, larva coll. 5 Oct, pupa 12 Oct [2021], killed by fungus, C. Doorenweerd, K.A. Austin / HOST: *Myrsine lessertiana* (Primulaceae), leaf-roller (UHIM).

Xyloryctidae**“*Eumenodora*” *tetrachorda* Meyrick****New state record**

Larvae of this species were found mining the needles of ironwood (*Casuarina equisetifolia* L., Casuarinaceae) on Kaua‘i and O‘ahu. The identification was provided by Mark Metz (USDA-SEL), but he noted that the higher taxonomy of this species is unresolved. He suggests that this species does not belong in Xyloryctidae, which Kaila (2013) transferred the type species of *Eumenodora* to without commenting on *E. tetrachorda* Meyrick. Metz (pers. comm., Aug 2022) suggested that *E. tetrachorda* belongs to Parametriotinae (Elachistidae). He also noted that a similar species known to mine needles of *Casuarina* in India, *Labdia xylineaula* Meyrick (Cosmopterigidae), may be conspecific. The types for both species (possibly in Calcutta) need to be carefully examined in order to resolve this. In addition to the pinned specimens listed below, numerous larvae are present in HDOA in three vials of 95% ethanol with same the data as the Kaua‘i specimens. This species is known from India.

Material examined. **Kaua‘i:** 2♂♂, Kapa‘a, Hotel Coral Reef, 22.07794, -159.31467, 16 Aug 2018 / ex. boring into *Casuarina equisetifolia* needles, coll. A. Tateno *et al.* (HDOA). **O‘ahu:** 3 sex undetermined, Honolulu, Ke‘ehi Lagoon Beach Park, 21.331244, -157.895321 / 30 Oct 2016, ex. boring into *Casuarina equisetifolia* needles, coll. M. Ramadan (HDOA).

Additional corrections to Nishida (2002) and Matsunaga *et al.* (2019) overlooked by Austin & Rubinoff (2022)

Erebidae

Simplicia caeneusalis (Walker) in Nishida (2002) should be *Simplicia cornicalis* (Fabricius) per Holloway (2008). This synonymy was overlooked by Austin & Rubinoff (2022).

Pyralidae

Paramyelois transitella (Walker) in Nishida (2002) should be *Amyelois transitella* (Walker) per Neunzig (1990). This current combination was overlooked by Austin & Rubinoff (2022).

Noctuidae

Heliiothis virescens (Fabricius) in Nishida (2002) should be *Chloridea virescens* (Fabricius) per Pogue (2013). This current combination was overlooked by Austin & Rubinoff (2022).

Athetis in Matsunaga *et al.* (2019) was listed as having been transferred to Erebidae by Zahiri *et al.* (2011). This is incorrect; *Athetis* belongs to Noctuidae and was never transferred to Erebidae. All other genera listed as Erebidae in Matsunaga *et al.* (2019) are correct.

Corrections to Austin & Rubinoff (2022)

Crambidae

Hellula undalis (Fabricius) was misspelled as *Hellula undulalis* (Fabricius) in the text of Austin & Rubinoff (2022).

Pyralidae

Aphomia cephalonica was mistakenly listed as *Corcyra cephalonica* in the text of Austin & Rubinoff (2022). The correct combination was used in their table 1.

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