Abstract. Blackburn & Sharp (1885: 146 & 147) described the first coccinellids found in Hawaii. The first documented introduction and successful establishment was of Rodolia cardinalis from Australia in 1890 (Swezey, 1923b: 300). This paper documents 167 coccinellid species as having been introduced to the Hawaiian Islands with forty-six (46) species considered established based on unpublished Hawaii State Department of Agriculture records and literature published in Hawaii. The paper also provides nomenclatural and taxonomic changes that have occurred in the Hawaiian records through time.

INTRODUCTION
The Coccinellidae comprise a large family in the Coleoptera with about 490 genera and 4200 species (Sasaji, 1971). The majority of coccinellid species introduced into Hawaii are predacious on insects and/or mites. Exceptions to this are two mycophagous coccinellids, Calvia decimguttata (Linnaeus) and Psyllobora vigintimaculata (Say). Of these, only P. vigintimaculata (Say) appears to be established, see discussion associated with that species’ listing. The members of the phytophagous subfamily Epilachninae are pests themselves and, to date, are not known to be established in Hawaii.

None of the Coccinellidae in Hawaii are thought to be either endemic or indigenous. All have been either accidentally or purposely introduced. Three species, Scymnus discendens (= Diomus debilis LeConte), Scymnus ocellatus (= Scymnobia galapagoensis (Waterhouse)) and Scymnus vividus (= Scymnus (Pullus) loewii Mulsant) were described by Sharp (Blackburn & Sharp, 1885: 146 & 147) from specimens collected in the islands. There are, however, no records of introduction for these species prior to Sharp’s descriptions. The first recorded beneficial insect introduction into Hawaii was made by Koebele in 1890 (Swezey, 1923b: 299) when he introduced Novius cardinalis Mulsant (= Rodolia cardinalis (Mulsant)) from Australia, probably via California. Koebele can be credited with the establishment of at least seventeen Coccinellidae in Hawaii. The early introductions were from Australia, the Orient, California and Mexico. Numerous coccinellids have been subsequently introduced, some multiple times, and the majority have not become established.

MATERIALS AND METHODS
This review expands on the established species covered by Leeper (1976) and Nishida (2002) by attempting to include all coccinellid species purposely or accidentally (adventive) introduced between 1885 and 2015. It identifies which species are considered established on one or more of the seven inhabited major islands (Hawaii, Maui, Lanai, Molokai, Oahu, Kauai and Niihau). Kahoolawe is among the eight major islands but is uninhabited and for which no comprehensive record of coccinellid establishment exists and is therefore not included.

A comprehensive review of materials published and unpublished in Hawaii, henceforth referred to as Hawaiian literature, was the source material for the findings presented in this paper. The major references included the unpublished Hawaii State Department of Agriculture (DoA) records, Nishida (2002), the Bishop Museum All Species Checklist (BMASC) on line, the Hawaiian Planters’ Monthly, the Hawaiian Planters’ Record, and the Proceedings of the Hawaiian Entomological Society. Additional records from Hawaiian literature were used when access was available. Species mentioned in the above sources, but not relating directly to the seven habited islands, were not covered in this paper. And, literature not published in Hawaii but relating to the islands is not included.

There are numerous incidences within Hawaiian literature where unidentified coccinellid species are mentioned by genus only. They, for the most part, have not been included in this review. Exceptions to this have been made when sufficient information has been provided to allow for identification of the
The species or if Hawaii State Department of Agriculture (DoA) unpublished records currently list the unidentified species.

The criteria used for species establishment was documentation of self-propagation, perpetuation and distribution of the species within the State. Leeper (1976) identified 38 coccinellid species as being established in Hawaii. Nishida (2002) identified 144 coccinellid species as having been introduced into the islands, with 62 identified as present on at least one island. This paper identifies 167 coccinellid species as having been introduced into Hawaii, under many more names. Forty-six (46) species are considered to have become established. Specimens from the Bernice P. Bishop Museum (BM), the DoA and the University of Hawaii, Manoa (UH) collections were examined in the process of writing this review.

Records of presence on an island and establishment are distinctly different things. Early coccinellid introductions were based on immediate release into the field which has led to records of island distribution for species that never achieved establishment. Thus making recorded presence on an island unreliable, in itself, as an indicator of establishment. There have also been more recent records of a species being present on an island but follow-up collection of specimens is lacking; suggesting a failure to establish.

The discrepancies in numbers of species introduced and established between the above mentioned sources are due to several additional factors. First, Leeper (1976) only covered coccinellid species identified as established at the time of writing. Second, as this paper documents, a number of species were introduced under more than one name due to name changes, misnomers and synonyms. And third, a few species were introduced after Nishida’s (2002) listing was compiled. Every attempt to document, correct and bring nomenclature up to date was made in writing this paper.

The species are numbered and listed in alphabetical order by their currently accepted name. Other names used within Hawaiian literature for a species then follow and are indented. The origin and date of introduction, the intended host and presence of specimens in the three collections mentioned above (BM, DoA, UH), island distribution and any discussion follow.

In most cases, if a species was mentioned multiple times within a paper, the page on which the species was first mentioned was referenced unless it was felt another page was more pertinent. Occasionally, more than one page was referenced for a species.

For consistency, abbreviation of names of species authors was replaced with the author’s full family name.

No effort was made to correct spelling or to provide the current nomenclature for the intended target pests. The intended target pest information is as provided in the documents or unpublished records.

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AN ANNOTATED CHECKLIST OF THE COCCINELLIDAE (COLEOPTERA) INTRODUCED TO THE HAWAIIAN ISLANDS.

1. **Adalia bipunctata** (Linnaeus)
   
   Purposely introduced, not established.


   **Adalia bipunctata Say**: Koebele, 1897b: 131; Koebele, 1898b: 265.


   **Adalia frigida**: BMASC.

   **Adalia humeralis**: BMASC.

   **Adalia humeralis Say**: Koebele, 1894: 102.

   **Coccinella bipunctata** Linnaeus: Swezey, 1925c: 374; Swezey, 1931c: 373; Lai & Funasaki, 1986: 23; DoA.

   **Coccinella bipunctata**: Swezey, 1913b: 147; BMASC.


   Germany 1909 (as *Adalia bipunctata* Linnaeus): Swezey, 1925c: 374; Swezey, 1931c: 373.

   Germany 1909 (as *Coccinella bipunctata* Linnaeus): Swezey, 1931c: 373.

   Germany 1911 (as *Coccinella bipunctata* Linnaeus): Swezey, 1925c: 374; Lai & Funasaki, 1986: 23; DoA.

   Germany 1909 & 1911, California 1952, Madeira 1962 (as *Adalia bipunctata* (Linnaeus)): DoA.


   Madeira 1962 (as *Adalia bipunctata* (Linnaeus)): Davis & Krauss, 1963: 248.

Collections: none.
Island distribution: none.

2. **Aiolocaria hexaspilota** (Hope)
Purposely introduced, not established.
*Aiolocaria hexaspilota* (Hope, 1831: 31): This is the first time this name has been used in refereeing to a species introduced to Hawaii. See discussion below.
Origin: Japan 1895 (as Aiolocaria mirabilis (Motschulsky)): Timberlake, 1943: 39.
Intended target pest: *Chrysomela*.
Collections: none.
Island distribution: none.
Discussion: Sasaji (1971: 296) stated “the *Aiolocaria*—examples commonly collected in Japan should be identified as *hexaspilota*. And the true *mirabilis* are obtained rather rarely from Hokkaido in Japan.” 
Poorani (2002: 15) subsequently showed *A. mirabilis* (Motschulsky) as a synonym of *A. hexaspilota* (Hope) and provided a complete list of synonyms.

3. **Anisorcus affinis** Crotch
Purposely introduced, not established.
*Anisorcus affinis* Crotch, 1874: 191; Koebele, 1901: 299; Swezey, 1925c: 374; Swezey, 1931c: 373; Lai & Funasaki, 1986: 5; Nishida, 2002: 50; BMASC; DoA.
Origin: Fiji 1899 (as Anisorcus affinis Crotch): Swezey, 1925c: 374; Swezey, 1931c: 373; Lai & Funasaki, 1986: 1; DoA.
*scales (Coccidae & Diaspididae): Lai & Funasaki, 1986: 1; DoA. 
Collections: none.
Island distribution: none.

4. **Apolinus lividigaster lividigaster** (Mulsant)
Purposely introduced, established.
*Apolinus lividigaster lividigaster* (Mulsant, 1853: 285): This is the first time where the full name, including the author’s name, has been used in refereeing to a species introduced to Hawaii. See discussion below.
*Apolinus lividigaster*: Tavares et al., 2012: 1.
Fullaway, 1912: 10; Swezey, 1912: 158; Ehrhorn, 1915a, plate 17 across from p. 138; Bryan, 1915: 393; Perkins, 1925: 360; Perkins, 1943: 2; Leeper, 1976, 300; BMASC.

_Apolinus lividigaster_ Mulsant: Leeper, 1976, 300.


Origin: Australia 1894 and 1896 (as _Scymnodes lividigaster_ (Mulsant): Lai & Funasaki, 1986: 66; DoA.


Australia, no date (as _Platyomus lividigaster_ Mulsant): Swezey, 1925d: 364.

No Origin 1894 (as _Scymnodes lividigaster_ (Mulsant)): Funasaki, Lai, Nakahara, Beardsley & Ota, 1988: 119.


_aphids_: Lai & Funasaki, 1986: 66; DoA.

Collections: BM, UH.


Discussion: Slipinski (2007: 99) declared new status for the genus _Apolinus_ Pope & Lawrence (1990: 244) and recognized _Platyomus_ Mulsant (1853: 285) as a junior homonym of the genus. Slipinski (2007: 101) then declared _Apolinus lividigaster_ (Mulsant) a new combination with _Platyomus lividigaster_ (Mulsant 1853: 286) and _Scymnodes lividigaster_ Blackburn (1895: 245) as synonyms. Poorani & Slipinski (2009: 574) further distinguished _Apolinus lividigaster lividigaster_ (Mulsant), with origin of Australia and introductions into New Zealand, Pacific Islands and Hawaii, from _Apolinus lividigaster wallacii_ (Crotch), with origin of New Guinea.

5. **Arawana arizonica** (Casey)

_Purposefully introduced, not established._

_Arawana arizonica_ (Casey, 1899: 107): This is the first time this name has been used in refereeing to a species introduced to Hawaii. See discussion below.

_Exochomus marginipennis_ LeConte: (misidentification) Koebele, 1894: 103; Craw, 1907: 150; Swezey, 1925c: 374; Swezey, 1931c: 373; Lai & Funasaki, 1986: 36; DoA.

_Exochomus marginipennis_ (LeConte): (misidentification) Nishida, 2002: 51; BMASC.

_Exochomus marginipennis_: Craw, 1907: 156.

Origin: California 1894 (as _Exochomus marginipennis_ LeConte): Koebele, 1894: 103.

_Arizona_ 1906 (as _Exochomus marginipennis_ LeConte): Swezey, 1925c: 374; Swezey, 1931c: 373; Lai & Funasaki, 1986: 36; DoA.

No Origin 1906 (as _Exochomus marginipennis_ LeConte): Craw, 1907: 150.

Intended target pest: _avocado mealybugs_: Swezey, 1925c: 374.

_mealybugs_: Lai & Funasaki, 1986: 36; DoA.

Collections: none.

Island distribution: none.

Discussion: According to Gordon (1985: 620 & 622 (map)) the distribution of _E. marginipennis_ is limited to no farther west than east Texas and Kansas while _A. arizonica_ is found in Arizona.

6. **Arawana cubensis** (Dimmock)
Quarantine, not established.

*Arawana cubensis* (Dimmock, 1906: 322): This is the first time this name has been used in refereeing to a species introduced to Hawaii. See discussion below.


*Exochomus cubensis*: BMASC.

Origin: none.

Intended target pest: scales.

Collections: none.

Island distribution: none.


7. *Archeleis edwardsi* (Mulsant)
Purposely introduced, not established.

*Archeleis edwardsi* (Mulsant 1850: 158): This is the first time this name has been used in refereeing to a species introduced to Hawaii. See discussion below.


Origin: Australia 1894 (as *Halzia pascoei* (Gootch)): Marsden, 1894: 31.

Intended target pest: aphids.

Collections: none.

Island distribution: none.

Discussion: It appears that the misnomer occurring in Marsden (1894: 31) was because in Crotch (1874: 131) the genus *Halzia* begins immediately following the description of *Egleis pascoei* Crotch. However, Slipinski (2007: 151) shows *Egleis pascoei* Crotch as a synonym of *Archeleis edwardsi* (Mulsant).

8. *Axion plagiatum* (Olivier)
Purposely introduced, not established.

*Axion plagiatum* (Olivier, 1808: 1044): Nishida, 2002: 50; BMASC.

*Axion pilatei*: BMASC.

*Exochomus pilatei* Mulsant: Koebele, 1894: 102; Craw, 1907: 150; Koebele, 1907: 160; Swezey, 1925c: 374; Swezey, 1931c: 373; Lai & Funasaki, 1986: 36; DoA.

*Exochomus pilatei*: Craw, 1907: 156; BMASC.


Arizona 1902 (as *Exochomus pilatei Mulsant*): Koebele, 1907: 160.

Arizona 1906 (as *Exochomus pilatei Mulsant*): Swezey, 1925c: 374; Swezey, 1931c: 373; Lai & Funasaki, 1986: 36; DoA.

No Origin 1906 (as *Exochomus pilatei Mulsant*): Craw, 1907: 150.

No Origin 1906 (as *Exochomus pilatei*): Craw, 1907: 156.


mealybugs: Lai & Funasaki, 1986: 36; DoA.

Collections: none.

Island distribution: none.

9. *Azya orbigera* Mulsant
Purposely introduced, established.


**Azya luteipes**: (misidentified) Ehrhorn, 1910c: 117; Ehrhorn, 1911b: 143; Fullaway, 1920: 241; Swezey, 1923a: 182; Swezey, 1931a: 333; BMASC.


**Azya orbigny**: Tavares et al., 2012: 1; Tavares et al., 2013: 2.

**Origin**: Mexico 1907 (as **Azya luteipes** Mulsant): Fullaway, 1914: 8; Swezey, 1925c: 370.

**Mexico 1908** (as **Azya luteipes** Mulsant): Swezey, 1923b: 300; Swezey, 1925d: 366; Swezey, 1931c: 369; Pemberton & Williams, 1938: 217; Swezey, 1943b: 6.

**Mexico 1908** (as **Azya luteipes**): Fullaway, 1920: 241.

**Mexico 1908** (as **Azya orbigny** Mulsant): Ehrhorn, 1916 144.

**Mexico 1908** (as **Azya orbigny**): Leeper, 1976: 286; Lai & Funasaki, 1986: 9; DoA.

**No Origin** 1908 (as **Azya orbigny** Mulsant): Funasaki et al., 1988: 113.

**Intended target pest**: *Coccus viridis* (Green): DoA.

Lecaniinae: Swezey, 1923b: 300; Swezey, 1925c: 370.

Lecanium scales: Swezey, 1925d: 366.


**Collections**: BM, DoA, UH.

**Island distribution**: Niihau, Kauai, Oahu, Molokai, Maui.

**Discussion**: Funasaki & Beardsley (1975: 8) discussed the misidentification of **Azya orbigny** Mulsant in Hawaii as **Azya luteipes** Mulsant.

10. **Bothrocalvia pupillata** (Swartz)

**Purposely introduced, established.**

**Bothrocalvia pupillata** (Swartz, in Schonherr, 1808: 184): Nishida, 2002: 50; BMASC; DoA

**Bothrocalvia pupillata** (Schonherr): Timberlake, 1943: 34.

**Bothrocalvia (Coelophora) pupillata** (Swartz): Zimmerman, 1948c: 75.

**Bothrocalvia pupillata**: Tavares et al., 2012: 1; Tavares et al., 2013: 1.

**Coccinella pupillata**: Perkins, 1925: 361; Perkins, 1943: 3; BMASC.

**Coccinella pupillata** Swift: Leeper, 1976: 289.

**Coelophora pupillata** (Schonherr): Ehrhorn et al., 1913: 299; Swezey, 1923b: 301; Swezey, 1925c: 371; Swezey, 1925d: 364; Timberlake, 1927: 532; Swezey, 1931c: 370; Williams, 1931: 183; Holdaway & Look, 1942 258; Swezey, 1943b: 5; Krauss, 1945: 313.

**Coelophora pupillata** Schonherr: Terry, 1904a: 299; Kotinsky, 1906e: 118; Kirkaldy, 1909a: 413; Silvestri, 1910: 313.

**Coelophora pupillata** Swift: Koebele, 1897a: 78; Koebele, 1897b: 120; Koebele, 1898a: 218; Leeper, 1976: 289.


**Coelophora pupillata** Kotinsky, 1905a: 153 & 156; Kirkaldy, 1907a: 101; Ehrhorn, 1910a: 21; Bryan, 1915: 393; Perkins, 1925: 361; Leeper, 1976: 289; Mau, 1977b: 411; BMASC.

**Origin**: Hong Kong 1895 (as **Coelophora pupillata** (Schonherr)): Swezey, 1923b: 301; Swezey, 1925c: 371; Swezey, 1931c: 370; Williams, 1931: 183.
Hong Kong 1895 (as Bothrocalvia pupillata (Swartz)): DoA.
Hong Kong, no date (as Coelophora pupillata (Schonherr)): Swezey, 1925d: 364.
No Origin: (as Coelophora pupillata (Swartz)): Lai & Funasaki, 1986: 25; Funasaki et al., 1988: 114.

aphids: Lai & Funasaki, 1986: 25; DoA.
Collections: BM, DoA, UH.
Island distribution: Kauai, Oahu, Molokai, Maui, Hawaii.

11. Brumoides suturalis (Fabricius)
Adventive introduction, established.

Brumoides suturalis: Tavares et al., 2013: 1.
Coccinella suturalis (Fabricius): Leeper et al., 1976 286.

Intended target pest: none.
Collections: BM, DoA, UH.
Island distribution: Niihau, Oahu.

12. Calvia decimguttata (Linnaeus)
Purposely introduced, not established.


Origin: Japan 1895 (as Calvia 10-guttata (Linnaeus)): Timberlake, 1943: 20.
Collections: none.
Island distribution: none.

13. Chilocorus bipustulatus (Linnaeus)
Purposely introduced, not established.
Chilocorus bipustulatus (Linnaeus, 1758: 367): Davis & Chong, 1968: 30; Nishida, 2002: 50; BMASC; DoA
Coccinella bipustulatus: BMASC.

Chilocorus bipustulata: (misspelling) Fullaway, 1952: 104.


California 1952 (as Chilocorus bipustulatus (Linnaeus)): DoA.
Intended target pest: scales (Diaspididae & Coccidae): Lai & Funasaki, 1986: 19; DoA.
Collections: none.
Island distribution: none.

14. Chilocorus cacti (Linnaeus)
Purposely introduced, not established.
Chilocorus cacti (Linnaeus, 1767: 584): Craw, 1907: 150; Swezey, 1925c: 373; Lai & Funasaki, 1986: 20;
Nishida, 2002: 50; BMASC.

Chilocorus cacti Linnaeus: Kotinsky, 1909: 109; Swezey, 1925c: 373; Swezey, 1931c: 373; DoA.

*Chilocorus circumdatus*: Perkins & Swezey, 1924: 27.

*Chilocorus circitii* Linnaeus: (misspelling) Koebele, 1898b: 265.

California and Mexico 1896 1902 1906 (as *Chilocorus circumdatus* Linnaeus): DoA.
Mexico 1924 (as *Chilocorus circumdatus*): Perkins & Swezey, 1924: 27.
No Origin 1906 (as *Chilocorus circumdatus Linnaeus*: Craw, 1907: 150.

**Intended target pest**: scales (Diaspididae): Lai & Funasaki, 1986: 20; DoA.

**Collections**: none.

**Island distribution**: none.

### 15. *Chilocorus circumdatus* (Gyllenhal)

**Purposely introduced, established**.


*Chilocorus circumdatus* Gyllenhal: Koebele, 1897a: 77; Koebele, 1897b: 120; Koebele, 1898a: 218; Kotinsky, 1906c: 419.


*Chilocorus circumdatus* Gyllenhal: (misspelling) Compere, 1899: 261.

**Origin**: China 1895 1942 (as *Chilocorus circumdatus* (Schonherr)): Leeper, 1976: 287; Lai & Funasaki, 1986: 20; DoA.

China 1895 (as *Chilocorus circumdatus* (Schonherr)): Timberlake, 1927: 532.
China 1895 (as *Chilocorus circumdatus* Schonherr): Swezey, 1923b: 300; Swezey, 1925c: 370; Swezey, 1931c: 369.
China 1895 (as *Chilocorus circumdatus*): Fullaway, 1920: 243.
China 1896 (as *Chilocorus circumdatus*): Kirkaldy, 1909a: 412.
China, no date (as *Chilocorus circumdatus* Schonherr): Swezey, 1925d: 364.

**Intended target pest**: armored scales: Lai & Funasaki, 1986: 20; DoA.

Diaspine scales: Swezey, 1923b: 300; Swezey, 1925c: 370; Swezey, 1925d: 364.
Lecaniinae, *Astrolecanium* spp., *Coccus viridis* (Green).

**Collections**: BM, UH.

**Island distribution**: Oahu, Molokai, Maui, Hawaii.
Discussion: The misidentification of the describer of *C. circumdatus* in Hawaiian literature prior to Nishida (2002: 50) is because Gyllenhal described the species in Schonherr.

16. *Chilocorus nigrita* (Fabricius)

Purposely introduced, established.


*Chilocorus nigrita* Fabricius: (misspelling) Davis, 1972: 188.


Ceylon 1958; Guam 1958 and 1971 (as *Chilocorus nigrita* (Fabricius)): Lai & Funasaki, 1986: 20; DoA.

Guam 1971 (as *Chilocorus nigrita* Fabricius): Davis, 1972: 188.

No Origin 1958 (as *Chilocorus nigrita* (Fabricius)): Funasaki et al., 1988: 113.

No Origin 1958; Guam 1971 (as *Chilocorus nigrita* (Fabricius)): Tsuda, 1974: 317.

Intended target pest: *Aspidiotus* spp.: Davis, 1959: 65; DoA.


Collections: BM, UH.

Island distribution: Oahu, Maui.

17. *Chilocorus orbus* Casey

Purposely introduced, not established.

*Chilocorus orbus* Casey, 1899: 105: This is the first time this name has been used in refereeing to a species introduced to Hawaii. See discussion below.


*Chilocorus bivulnerus* (Say): Lai & Funasaki, 1986: 20; DoA.

*Chilocorus bivulnerus* Mulsant: (misspelling) Koebele, 1897a: 75; Koebele, 1897b: 116; Koebele, 1898a: 215.

*Chilocorus bivulnerus* Mulsant: Kotinsky, 1906c: 415; Swezey, 1925c: 373; Swezey, 1931c: 372.

*Chilocorus bivulnerus*: BMASC.

*Chilocorus stigma* (Say): Lai & Funasaki, 1986: 21; Nishida, 2002: 50; BMASC; DoA.


California 1891 (as *Chilocorus bivulnerus* Mulsant): Swezey, 1925c: 373.

Australia 1891 (as *Chilocorus bivulnerus* Mulsant): Koebele, 1897a: 75; Koebele, 1897b: 116.

California 1891 (as *Chilocorus bivulnerus* (Say)): Lai & Funasaki, 1986: 21; DoA.

California 1897 (as *Chilocorus bivulnerus*): Koebele, 1897b: 132.

California 1891 and 1894 (as *Chilocorus stigma* (Say)): Lai & Funasaki, 1986: 21; DoA.

Intended target pest: *Asterolecanium* spp.: Lai & Funasaki, 1986: 20; DoA.

*Leucanium*, etc.: Swezey, 1925c: 373.

Collections: none.

Island distribution: Oahu.

Discussion: Gordon (1985: 649) points out that *Chilocorus stigma* does not occur in California and specimens from California are *Chilocorus orbus*. Gordon (1985: 648) also lists *Chilocorus bivulnerus* as a
synonym of C. orbus. There is further confusion with Koebele (1897a: 75; 1897b: 116) recording an 1891 introduction of Chilocorus bivulnerus Mulsant from Australia while Slipinski (2007) does not list any of the above synonyms as from Australia. Koebele may have actually misidentified Chilocorus circumdatus (Gyllenhal) as Chilocorus bivulnerus Mulsant which Slipinski (2007: 75) lists as Australian. However, Hawaiian records indicate introductions of Chilocorus circumdatus (Gyllenhal) only from China beginning in 1895. Although Nishida (2002: 50) shows Chilocorus stigma as present on Oahu, none of the three museums have specimens in their collections. Species establishment is dubious at best and therefore not considered established.

18. Chilocorus kuwanae Silvestri
Purposely introduced, not established.
Chilocorus kuwanae Silvestri, 1909: 126: This is the first time this name has been used in refereeing to a species introduced to Hawaii. See discussion below.

Chilocorus similis Rossi: (misspelling) Koebele, 1897b: 132; Koebele, 1898b: 265.
Chilocorus similis Rossi: Kotinsky, 1905b: 266; Kotinsky, 1906d: 29; Kotinsky, 1906e: 114;
Kirkaldy, 1909a: 412; Silvestri, 1910: 309; Swezey, 1931c: 373; Lai & Funasaki, 1986: 20; DoA.
Chilocorus similis (Rossi 1790): Swezey, 1925c: 373; Nishida, 2002: 50; BMASC.
Origin: Japan 1895 and 1905 (as Chilocorus similis Rossi): Swezey, 1925c: 373; Swezey, 1931c: 373; Lai & Funasaki, 1986: 20; DoA.

Intended target pest: scale insects: Swezey, 1925c: 373.

scales (Coccidae & Diaspididae): Lai & Funasaki, 1986: 20; DoA.
Collections: none.
Island distribution: none.
Discussion: This species was also introduced to California from Japan under the name C. similis which Gordon (1985: 652) notes “has been the subject of debate for some years. Chilocorus kuwanae is the name in current usage by Japanese scientists, and is the correct name.” This is in most likelihood the case for what was introduced into Hawaii.

19. Cleothera sp.
Purposely introduced, not established.
Cleothera sp.: Swezey et al., 1939: 351; Lai & Funasaki, 1986: 23; DoA.
Origin: Panama 1931 (as Cleothera sp.): Swezey et al., 1939: 351; Lai & Funasaki, 1986: 23; DoA.

Intended target pest: Dysmicoccus brevipes (Cockerell): Lai & Funasaki, 1986: 23; DoA.
Collections: none.
Island distribution: none.
Discussion: The only other Cleothera species was introduced into Hawaii as C. bromelicola Sicard 1925. It was also introduced from Panama in 1924 and has been found to be a synonym of Tenuisvalvae bromelicola (Sicard, 1925). Without specimens to compare, it is impossible to determine if this unidentified Cleothera species could also be T. bromelicola.

20. Coccidophilus citricola Brethes
Purposely introduced, not established.
Coccidophilus citricola Brethes, 1905: 76: Swezey et al., 1939: 351; Lai & Funasaki, 1986: 23; BMASC; DoA.

Origin: California. 1936 and 1938 (as Coccidophilus citricola Brethes): Lai & Funasaki, 1986: 23; DoA.
California 1938 (as Coccidophilus citricola Brethes): Swezey et al., 1939: 351.
Intended target pest: Diaspine coccid: Swezey et al., 1939: 351.
scales (Diaspididae & Coccidae): Lai & Funasaki, 1986: 23; DoA.
Collections: none.
Island distribution: none.
Discussion: The BMASC places Coccidophilus citricola Brethes in the family Discolomidae rather than Coccinellidae.

21. Coccinella californica Mannerheim
Purposely introduced/Accidentally introduced, not established.

California 1894 (as Coccinella californica Mannerheim): Koebele, 1894: 102; Swezey, 1931c: 370.
California 1894 (as Coccinella californica Mannerheim): Koebele, 1897a: 75; Koebele, 1897b: 116.
California 1905 (as Coccinella californica Mannerheim): Swezey, 1925c: 374; Swezey, 1931c: 373.
Collections: UH.
Island distribution: Kauai, Oahu.
Discussion: Although records indicate C. californica is found on two islands, specimens appear to have been intercepted on incoming produce from North America.

22. Coccinella septempunctata Linnaeus
Purposely introduced, established.
Coccinella septempunctata Linnaeus, 1758: 365; Swezey, 1925c: 374; Swezey, 1931c: 373; Beardsley, 1982: 11; Lai & Funasaki, 1986: 24; Nishida, 2002: 50; Starr et al., 2004: 50; BMASC; DoA.

Coccinella 7-punctata subsp. brucki: BMASC.
Coccinella 7-punctata var. brucki Mulsant: Leeper, 1976: 288; Lai & Funasaki, 1986: 24; DoA.
Coccinella 7-punctata bruckii Mulsant: (misspelling) Funasaki et al., 1988: 113.
Coccinella bruckii: (misspelling) Swezey, 1925c: 374; Swezey, 1931c: 373.
Coccinella bruckii: Leeper, 1976: 287; BMASC.
Coccinella septempunctata subsp. brucki: BMASC.
Coccinella septempunctata Mulsant: Davis, 1979: 19.
Island distribution: Kauai, Oahu, Lanai, Maui, Hawaii.

Intended target pest: plant lice: Swezey, 1925c: 374; Swezey, 1931c: 373.

Germany 1909; Japan 1913 (as Coccinella septempunctata Linnaeus): Lai & Funasaki, 1986: 24; DoA.
Japan 1913 (as Coccinella bruckii Mulsant): Swezey, 1925c: 374; Swezey, 1931c: 373.


Collections: BM, DoA, UH.
Island distribution: Kauai, Oahu, Molokai, Lanai, Maui, Hawaii.

Discussion: Hawaiian literature dealing with this species has contained errors that confuse what has actually been introduced and established. Records indicate that all introductions prior to 1958 were unsuccessful in achieving establishment. The introduction from Okinawa in 1958 was successful with this species has contained errors that confuse what has actually been introduced and established. Records indicate that all introductions prior to 1958 were unsuccessful in achieving establishment. The introduction from Okinawa in 1958 was successful with the DoA records identifying it as Coccinella 7-punctata var. brucki Mulsant. However, Sasaji (1971: 253-254) points out that C. septempunctata is found in Okinawa while C. septempunctata brucki is found on the Japanese mainland. Therefore, it is C. septempunctata Linnaeus that is established in Hawaii.

23. Coccinella transversalis Fabricius
Purposely introduced, dubious establishment.

Coccinella transversalis Fabricius, 1781: 97; Timberlake, 1943: 14; Nishida, 2002: 50; BMASC.


Coccinella repanta Thunberg: (misspelling) Koebele, 1896: 597; Koebele, 1897a: 75; Koebele, 1897b: 117; Koebele, 1898a: 216; Compere, 1899: 261.

Coccinella repanta: (misspelling) Koebele, 1896: 598; Koebele, 1897a: 75; Koebele, 1897b: 116 & 118; Koebele, 1898a: 215.

Origin: Australia 1894 (as Coccinella repanda (Thunberg)): Marsden, 1894: 31.
Australia, reported present in 1897 (as Coccinella repanda Thunberg): Koebele, 1897 b: 116.
Australia 1904 (as Coccinella repanda): Kotinsky, 1905a: 156.
Australia 1919 (as Coccinella repanda Thunberg): Swezey, 1925c: 374; Swezey, 1931c: 373; Lai & Funasaki, 1986: 24; DoA.

aphids: Lai & Funasaki, 1986: 24; DoA.

Collections: none.
Island distribution: Kauai, Oahu, Lanai, Maui, Hawaii.
Discussion: There is confusion as to whether *C. transversalis* is established in Hawaii. The use of *C. repanda* appears to have been due to a misidentification of *Coelophora inaequalis* (see below) an error first noted by Giffard (1908a: 173). The island distribution shown above is undoubtedly for *C. inaequalis*. Species establishment is dubious at best and therefore not considered established.

24. **Coccinella trifasciata perplexa** Mulsant

Purposely introduced, not established.

*Coccinella trifasciata perplexa* Mulsant, 1850: 1022: This is the first time this name has been used in refereeing to a species introduced to Hawaii. See discussion below.

*Coccinella trifasciata* Linnaeus: Nishida, 2002: 50; BMASC.

*Coccinella tri fasciata* Linnaeus, two varieties *juliana* and *subversa*: Koebele, 1894: 102.

Origin: California 1894 (as *Coccinella trifasciata*). Koebele, 1894: 102.

Intended target pest: aphids.

Collections: BM.

Island distribution: Oahu.

Discussion: A single specimen, collected in 1930, is in the Bishop Museum with a note that it had been determined by R. D. Gordon to be *Coccinella trifasciata* var. *perplexa*. However, Gordon (1985: 787) shows *perplexa* as a subspecies of *C. trifasciata*.

25. **Coelophora atrolineata** Fairmaire

Purposely introduced, established.


scales (Diaspididae & Coccidae): Lai & Funasaki, 1986: 24; DoA.

Collections: UH.

Island distribution: Kauai, Oahu, Maui, Hawaii.

26. **Coelophora circumusta** (Mulsant)

Purposely introduced, not established.

*Coelophora circumusta* (Mulsant, 1850: 389): This is the first time this name has been used in refereeing to a species introduced to Hawaii. See discussion below.

*Artemis circumusta* Mulsant: Timberlake, 1943: 30; Nishida, 2002: 51; BMASC.

Origin: Kowloon 1900 (as *Artemis circumusta*): Timberlake, 1943: 30.


Collections: none.

Island distribution: none.

Discussion: Poorani (2002: 22) synonymizes *Artemis circumusta* with *Coelophora circumusta* but also notes lacks tibial spurs and may not be a true *Coelophora*.

27. **Coelophora inaequalis** (Fabricius)

Purposely introduced, established.

*Coelophora inaequalis* (Fabricius, 1775: 80): Ehrhorn et al., 1913: 298; Timberlake, 1918: 401-402; Illingworth, 1923b: 279; Swezey, 1923b: 301; Timberlake, 1924: 351; Timberlake, 1925: 2; Swezey, 1925c: 370; Swezey, 1925d: 364; Illingworth, 1927: 393; Timberlake 1927: 532; Illingworth, 1928: 44; Swezey, 1928b: 181; Swezey & Bryan, 1929: 298; Swezey, 1931c: 370; Williams, 1931: 182; Swezey &

*Coccinella inaequalis* subs. *novemmaculata*: BMASC.
*Coccinella inaequalis* var. *novemmaculata* (Fabricius, 1781: 80): Leeper, 1976: 288; Nishida, 2002: 50; DoA.
*Coccinella inaequalis* Fabricius: Zimmerman, 1948c: 100.
*Coelophora inaequalis*: Giffard, 1908a: 173; Giffard, 1908b: 181; Silvestri, 1910: 313; Swezey, 1910: 114; Ehrhorn, 1910a: 21; Ehrhorn, 1910d: 178; Ehrhorn, 1911a: 115; Perkins, 1913: cx; Ehrhorn, 1915a, plate 17 across from p. 138; Bryan, 1915: 394; Fullaway, 1918: 16; Muir, 1921: 121; Fullaway, 1922a: 11; Fullaway et al., 1922: 26; Fullaway, 1924b: 432; Perkins, 1925: 360; Perkins, 1943: 2; Zimmerman, 1948c: 56; Beardsley, 1965a: 26; Leeper, 1976: 288; Mau, 1977b: 411; Tavares et al., 2012: 1; Tavares et al., 2013: 1.
*Coelophora inaequalis* subs. *comperei*: BMASC.
*Coelophora inaequalis* subs. *novemmaculata*: BMASC.
*Coelophora inaequalis* subs. *novemmaculata*: BMASC.
*Coelophora inaequalis* (Fabricius): (misspelling) Swezey 1912: 158; Swezey 1913a: 199; Illingworth 1923b: 279; Swezey 1935b: 97.

**Origin:** Ceylon, Australia and China 1894 (as *Coelophora inaequalis*): Fullaway et al., 1922: 26; Leeper, 1976: 288; Lai & Funasaki, 1986: 24.

Australia, Ceylon, China 1894 (as *Coelophora inaequalis* (Fabricius)): Swezey, 1923b: 301; Swezey, 1925c: 370; Swezey, 1931c: 370; Williams, 1931: 182.
Australia 1894 (as *Coelophora inaequalis* Fabricius): Illingworth, 1929: p. 249.
Australia 1894 (as *Coelophora inaequalis* (Fabricius)): Swezey, 1931c: 370; Swezey, 1936: 84; Fullaway & Krauss, 1945: 75; Pemberton, 1964a: 704.
Australia 1894 1958; China 1894; Philippines 1958; Sri Lanka 1894 (as *Coelophora inaequalis* (Fabricius)): Leeper, 1976: 288; DoA.
Australia 1894 (as *Coelophora inaequalis*): Perkins, 1925: 360; Perkins, 1943: 2.
Australia, no date (as *Coelophora inaequalis* (Fabricius)): Swezey, 1925d: 364.
No Origin 1894 (as *Coelophora inaequalis*): Funasaki et al., 1988: 114.
Philippines 1958 (as *Coelophora inaequalis* (Fabricius)): Davis, 1959: 64.

**Intended target pest:** plant lice: Swezey, 1925c: 370; Swezey, 1925d: 364-365.
*Aphis gossypii* Glover: Davis, 1959: 64.

Collections: none.
Island distribution: Niihau, Kauai, Oahu, Molokai, Lanai, Maui, Hawaii.
Discussion: There is wide variation in the elytral patterns in *C. inaequalis* as first detailed by Timberlake (1922). This variation has contributed to synonymies and misidentifications. Gordon (1985: 831) preferred not to use sub specific definition *comperei* and recommended further study. That could also be said for sub specific of the *C. inaequalis* in general. Also, see the discussion above for *C. transversalis*.

**28. Coelophora saucia calypso** (Mulsant)
Purposely introduced, not established.
*Coelophora saucia calypso* (Mulsant, 1856: 145): Correction with author in parenthesis.
   *Coelophora saucia* Mulsant: BMASC.
   *Coelophora saucia* subsp. *calypso* Mulsant: BMASC.
Origin: China 1896 (as *Lemnia saucia calypso* (Mulsant)): Timberlake, 1943: 30.
Intended target pest: none.
Collections: none.
Island distribution: none.
Discussion: Timberlake (1943: 30) notes that the Koebele collection contained four males collected in China and the following “Honolulu, March 4 1896, many specimens on aphid on orange at Mr. Jordan's.” This is the only mention of this species found in Hawaiian literature until Nishida (2002: 50).

**29. Coelophora sp.**
Purposely introduced, not established.
*Coelophora sp.*: Davis, 1959: 64; Lai & Funasaki, 1986: 25; DoA.
Origin: Philippines 1958 (as *Coelophora sp.*): Davis, 1959: 64; Lai & Funasaki, 1986: 25; DoA.
Intended target pest: aphids: Lai & Funasaki, 1986: 25; DoA.
Collections: none.
Island distribution: none.

**30. Coleomegilla cubensis** (Casey)
Purposely introduced, not established.
*Coleomegilla cubensis* (Casey, 1908: 394): Nishida, 2002: 50; BMASC.
   *Coleomegilla vittigera* (misidentification) Fullaway, 1952: 104.
Collections: none.
Island distribution: none.

**31. Cryptognatha nodiceps** Marshall
Purposely introduced, not established.
Intended target pest: Diaspine coccid: Swezey et al., 1939: 351.
scales (Diaspididae): Lai & Funasaki, 1986: 27; DoA.
Collections: none.
Island distribution: none.

32. Cryptogonus orbiculus (Gyllenhal)
Purposely introduced, not established.
Cryptogonus orbiculus (Gyllenhal, in Schonherr, 1808: 205): Swezey, 1925c: 370; Swezey, 1931c: 369;
Chapman, 1938: 320; Nishid, 2002: 50; BMASC; DoA.
Cryptogonus orbiculatus Gyllenhal: Koebel, 1897a: 78; Koebel, 1897b: 120; Koebel, 1898a: 218; Swezey, 1923b: 300.
Cocinella orbiculus: BMASC.
Origin: Japan 1894 (as Cryptogonus orbiculus (Gyllenhal)): Swezey, 1925c: 370; Lai & Funasaki, 1986: 27; DoA.
Japan 1894 (as Cryptogonus orbiculatus Gyllenhal): Koebel, 1897b: 120; Swezey, 1923b: 300.
Australia via California, ? (as Cryptogonus orbiculus (Gyllenhal)): Chapman, 1938: 320.
Japan, ? (as Cryptogonus orbiculus (Gyllenhal)): Swezey, 1925c: 370; Swezey, 1931c: 369.
Guam 1936 (as Cryptogonus nigripennis Weise): Pemberton & Williams, 1938: 218; Swezey, 1939a: 180; Swezey, 1939b: 186.
Intended target pest: mealybugs: Swezey 1923b: 300; Swezey, 1925c: 370; DoA.
Pseudococcus brevipes: Chapman, 1938: 320 & 323.
Collections: none.
Island distribution: Oahu.

33. Cryptolaemus montrouzieri Mulsant
Purposely introduced, established.
Cryptolaemus montrouzieri Mulsant, 1853: 140: Koebel, 1897a: 67; Koebel, 1897b: 106-107; Koebel, 1898a: 208; Compere, 1899: 261; Terry, 1904a: 300; Kotinsky, 1906e: 118; Swezey, 1912: 158; Ehrhorn et al., 1913: 298; Fullaway et al., 1922: 26; Illingworth, 1923b: 279; Swezey, 1923b: 300; Swezey, 1925c: 370; Swezey, 1925d: 364; Illingworth, 1927: 393; Chapman, 1938: 320 & 322; Illingworth, 1929: 248; Swezey & Bryan, 1929: 298; Swezey, 1931c: 369; Williams, 1931: 184; Bryan, 1932: 3; Swezey & Williams, 1932: 184; Swezey, 1935b: 97; Swezey, 1936: 89; Illingworth, 1938a: 3; Swezey et al., 1939: 352; Sakimura & Linford, 1940: 452; Holdaway & Look, 1942: 258; Swezey, 1943b: 5; Krauss, 1944b: 86; Fullaway & Krauss, 1945: 75; Krauss, 1945: 313; Swezey, 1946: 470; Fullaway, 1947: 52; Pemberton, 1948: 74; Zimmerman, 1948c: 75, 185, 189, 229, 250, 260, 266, 271, 290, 311, 333; Carter, 1950: 8;
Island distribution: Niihau, Kauai, Oahu, Molokai, Lanai, Maui, Hawaii.

Collections: BM, DoA, UH.

Intended target pest: Pseudococcus brevipes: Chapman

Origin: 2007: 2; Starr, Samuelson 180; Suehiro, Tuthill 894: 32.


Cryptolaemus montrouzierii: (misspelling) Kirkaldy, 1909b: 53.


Cryptolaemus: (misspelling) Craw, 1905b: 323.


Rhizobius montrouzier: Marsden, 1894: 32.

Origin: Australia 1894 (as Cryptolaemus montrouzieri (Mulsant) and Rhizobius montrouzieri): Marsden, 1894: 32.

Australia via California 1894 (as Cryptolaemus montrouzieri Mulsant): Swezey, 1923b: 300; Swezey, 1925c: 370; Chapman, 1938: 320; Illingworth 1929: 248; Swezey, 1931c: 369; Fullaway & Krauss, 1945: 75; Leeper, 1976: 289; DoA.


California 1894 (as Cryptolaemus montrouzieri Mulsant): Williams, 1931: 184; Pemberton, 1964a: 702.


Australia 1894 (as Cryptolaemus montrouzieri Mulsant): Fullaway, 1920: 240.


Australia 1904 (as Cryptolaemus montrouzieri): Kotinsky, 1905a: 153.


No Origin 1894 (as Cryptolaemus montrouzieri Mulsant): Funasaki et al., 1988: 122.


No Origin 1894 (as Cryptolaemus): Muller, 1895: 261.

No Origin 1906 (as Cryptolaemus montrouzieri): Craw, 1907: 156.


Pulvinaria psidii: Maskell: Lai & Funasaki, 1986: 27; DoA.

Mealybugs: Swezey, 1923b: 300; Swezey, 1925c: 369.

Collections: BM, DoA, UH.

Island distribution: Niihau, Kauai, Oahu, Molokai, Lanai, Maui, Hawaii.
34. Curinus coeruleus Mulsant
Purposely introduced, established.


Orcus coerulis Mulsant: (misspelling) Lai & Funasaki, 1986: 55; DoA.


Mexico 1922 (as Orcus coeruleus Mulsant): (misspelling) Lai & Funasaki, 1986: 55; DoA.


Intended target pest: mealybugs: Lai & Funasaki, 1986: 55; DoA.

Nipaecoccus nipae (Maskell): Lai & Funasaki, 1986: 27; DoA.


Collections: BM, DoA, UH.

Island distribution: Niihau, Kauai, Oahu, Molokai, Lanai, Maui, Hawaii.

35. Cycloneda conjugata (Mulsant)
Adventive introduction, not established.


Collections: DoA.

Island distribution: Oahu, Hawaii.

Discussion: The DoA has 2 specimens from Oahu and 2 specimens from Hawaii in their collection. Nishida (2002: 50) and the BMASC show the species in quarantine.

36. Cycloneda sanguinea limbifer Casey
Purposely introduced, not established.


Cycloneda limbifer: Fullaway, 1952: 104; BMASC.

Cycloneda sanguinea subsp. limbifer Casey: BMASC.


Cycloneda sanguinea Linnaeus: (misspelling) DoA.

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Mexico 1896; California 1955 (as Cycloneda sanquinea Linnaeus): (misspelling) DoA.
Collections: DoA.
Island distribution: none.
Discussion: Gordon (1985: 822) places Cycloneda limbifer as a subspecies of Cycloneda sanguinea.

37. Cycloneda sanguinea sanguinea Linnaeus
Purposely introduced, established.
Cycloneda sanguinea Linnaeus: Koebele, 1894: 102; Koebele, 1897b: 131; Swezey, 1931c: 373; BMASC; DoA.
Cycloneda sanguinea subsp. sanguinea: BMASC.
Origin: Mexico 1896; California and Mexico 1955 (as Cycloneda sanguinea Linnaeus): DoA.
Mexico 1896 (as Cycloneda sanquinea Linnaeus): Swezey, 1931c: 373.
California 1890s and Mexico 1955 (as Cycloneda sanguinea (Linnaeus)): Kumashiro et al., 2001: 172.
Collections: DoA.
Island distribution: Oahu.

38. Cyrea quinquenotata (Mulsant)
Purposely introduced, not established.
Cyrea quinquenotata (Mulsant, 1850: 548): This is the first time this name has been used in refereeing to a species introduced to Hawaii. See discussion below.
Collections: none.
Island distribution: none.
Discussion: Pandey (2002: 27) lists Hyperaspis quinquenotata Mulsant and cites Sakimura (1939: 352) which in this article is cited as Swezey et al. (1939: 352). This was an error, Chapman (1938: 325) should have been cited. Chapman (1938: 325) notes that the shipment failed. Gordon et al. (2013: 111) designated Cleothera (Cyra) quinquenotata Mulsant the type species. Crotch (1874: 215) had placed Cleothera quinquenotata Mulsant as a synonym of Hyperaspis quinquenotata Mulsant thus giving the name previously used in Hawaiian literature.

39. Delphastus catalinae (Horn)
Purposely introduced, established.

*Delphastus catalinae* (Horn, 1895: 83): This is the first time this name has been used in refereeing to a species introduced to Hawaii. See discussion below.


*Delphastus pusillus*: (misidentification) Anonymous, 2006: 3; DoA.


*Delphastus pusillus*: (misidentification) Anonymous, 2006: 3; DoA.

*Oeneis pusillus*: BMASC.

**Origin:** Trinidad 1980 (as *Delphastus catalinae* (Horn)): DoA.

No Origin 1980 (as *Delphastus pusillus* (LeConte)): (misidentification) Funasaki et al., 1988: 115.


Intended target pest: *Aleurodicus dispersus* Russell: Lai et al., 1986: 29; DoA.

Collections: BM.

Island distribution: Kauai, Oahu, Maui, Hawaii.

Discussion: The specimens in the Bishop Museum are labeled as *Delphastus pusillus* were collected in 1980-1991 and have a notation that they were determined by R. D. Gordon. However, Hoelmer & Pickett (2003: 530) point out that the distribution of *Delphastus pusillus* is restricted to the eastern half of the U.S., and that of *Delphastus catalinae* (Horn) is recorded as extending from Colombia north through Mexico into coastal southern California, and to the east to the island of Trinidad in the West Indies. Therefore, the species in Hawaii is *Delphastus catalinae*. Gordon (1970: 366 & 367) describes both species. Unpublished DoA records use the correct name, *Delphastus catalinae* (Horn).

40. *Delphastus diversipes* (Champion)

Purposely introduced, not established.

*Delphastus diversipes* (Champion, 1913: 126): This is the first time this name has been used in refereeing to a species introduced to Hawaii. See discussion below.


**Origin:** Trinidad 1953 (as *Lioscymnus diversipes* Champion): Weber, 1954: 370; Lai et al., 1986: 45; DoA.

Intended target pest: *Asterolecanium bambusae* Boisduval: Lai et al., 1986: 45; DoA.


Collections: none.

Island distribution: none.

Discussion: Chapin (1940: 263) determined that the genus *Lioscymnus* Champion was a synonym of the genus *Delphastus* Casey. Gordon (1970: 367) listed *Lioscymnus diversipes* Champion as a synonym of *Delphastus diversipes* (Champion).

41. *Diomus australasiae* (Blackburn)

Adventive introduction, not established.

*Diomus australasiae* (Blackburn, 1892b: 243): This is the first time this name has been used in refereeing to a species introduced to Hawaii. See discussion below.

*Scymnus australasiae* Blackburn: Marsden, 1894: 32.

**Origin:** Australia 1894 (as *Scymnus australasiae* Blackburn): Marsden, 1894: 32.


Collections: none.

Island distribution: none.
Discussion: Slipinski (2007: vii and 89) transferred *Scymnus australasiae* to the genus *Diomus*.

42. *Diomus debilis* (LeConte)

**Purposely introduced, established.**


*Scymnus debilis* LeConte: Kirkaldy, 1909b: 56; Ehrhorn, 1914a: 1; Swezey, 1914a: 8; Fullaway, 1920: 240; BMASC.


*Scymnus debitis* LeConte: (misspelling) Koebele, 1894: 103.

*Scymnus discendens*: BMASC.

**Origin:** California 1894 (as *Scymnus debilis* LeConte): Koebele, 1894: 103.

*No Origin* 1893 (as *Scymnus debilis* LeConte): Koebele, 1907: 159.


**Intended target pest:** *Dactyllopius*: Koebele, 1894: 103.

Collections: BM, DoA, UH.

**Island distribution:** Kauai, Oahu, Molokai, Lanai, Maui, Hawaii.

**Discussion:** *Diomus debilis* was described as *Scymnus discendens* Sharp in Blackburn & Sharp (1885: 147) from specimens collected in Hawaii and later determined to be a junior synonym of *Diomus debilis*. *Diomus debilis* is an American species (Gordon, 1976:354). With Koebele’s (1894: 103) documentation, the status of *Diomus debilis* can be moved from adventive to a purposeful introduction.

43. *Diomus ementitor* (Blackburn)

**Purposely introduced, not established.**

*Diomus ementitor* (Blackburn, 1895: 248): This is the first time this name has been used in refereeing to a species introduced to Hawaii. See discussion below.

*Scymnus ementidor* Blackburn: (misspelling) Terry, 1904: 301.

**Origin:** Australia, no date (as *Scymnus ementidor* Blackburn): (misspelling) Terry, 1904: 301.

**Intended target pest:** aphids: Terry, 1904: 301.

Collections: none.

**Island distribution:** none.

**Discussion:** Slipinski (2007: 89) places this species in the genus *Diomus*. Terry (1904: 301) appears to be the only reference to this species in Hawaiian literature and may have been a misidentification of *Apolinus lividigaster* (Mulsant). Due to uncertainty, it is listed separately.

44. *Diomus notescens* (Blackburn)

**Purposely introduced, established.**


**Scymnus notescens** Weise is most likely a misidentification as *Diomus ?pumilio*; Leeper & Beardsley, 1973: 8a; Leeper, 1976: 292.

**Scymnus notescens** (Blackburn): Swezey & Bryan, 1988: 110 and 123; DoA.


**Diomus pumilio** (Weise, 1885: 237): Nishida, 2002: 50; BMASC; DoA.

**Scymnus flavifrons** (Blackburn): Marsden, 1894: 32.


**Diomus pumilio** Davis, 1978: 100.

**Diomus ?pumilio** Weise: Funasaki et al., 1988: 110 and 123; DoA.


Collections: BM, DoA, UH.

Island distribution: Kauai, Oahu, Molokai, Lanai, Maui, Hawaii.

**45. Diomus pumilio** (Weise)

**Purposely introduced, not established.**

**Diomus pumilio** (Weise, 1885: 237): Nishida, 2002: 50; BMASC; DoA.

*Scymnus flavifrons* (Blackburn): Marsden, 1894: 32.


**Diomus pumilio** Davis, 1978: 100.

**Diomus ?pumilio** Weise: Funasaki et al., 1988: 110 and 123; DoA.


Collections: UH.

Island distribution: Oahu, Hawaii.

Discussion: The introduction from Mexico of *Diomus ?pumilio* Weise is most likely a misidentification as *Diomus pumilio* is an Australian species. Leeper (1976: 292) and Leeper & Beardsley (1976: 314) reported on the introduction and establishment of *Diomus pumilio* Weise to Hawaii. Subsequently, it appears that the species did not become established.

**46. Diomus sp. near pumilio**

**Dubious introduction, not established.**

**Diomus sp. near pumilio** Leeper, 1976: 292.

Diomus ?pumilio (Weise): DoA.

Origin: see Discussion


Intended target pest: see Discussion.


Collections: none.

Island distribution: Oahu, Molokai, Hawaii.

Discussion: There is considerable confusion as to what this or the other unidentified Diomus species are and when they arrived in Hawaii. DoA records indicate that Diomus pumilio (Weise) was introduced from Mexico in 1922 to control mealybugs. DoA records also indicate establishment on Oahu but specimens are not in the DoA collection. Leeper (1976: 292) reported from specimens in the UH collection and that introduction data is not available. The first collection was made on Oahu in 1932. The UH collection also contained specimens collected by Beardsley listing Pseudococcus sp., Pseudococcus montanus and Trionymus rostellum as hosts. The specimens studied for writing the 1976 paper no longer appear in the UH collection. Species establishment is dubious at best and therefore not considered established.

47. Diomus sp. (four-lined)

Purposely introduced, not established.


Origin: Mexico 1922 (as Diomus sp. (four-lined)): Swezey, 1923b: 300; Swezey, 1925c: 370; Swezey, 1931c: 369; Chapman, 1938: 320.

Mexico 1922 (as Diomus sp.): Lai et al., 1986: 31; Gonzalez-Hernandez, 1995: 11; Pandey, 2002: 26; DoA.


Collections: none.

Island distribution: none.

48. Diomus sp.

Purposely introduced, not established.

Diomus sp.: Swezey, 1923b: 300; Swezey, 1925c: 370; Swezey, 1931c: 369; Chapman, 1938: 320; Lai et al., 1986: 31; Gonzalez-Hernandez, 1995: 11; Pandey, 2002: 26; DoA.


Pseudococcus brevipes: Chapman, 1938: 320 & 321

Dysmicoccus boninsiss (Kuwana): Lai et al., 1986: 31; DoA.

Collections: none.

Island distribution: none.

49. Diomus sp.

Purposely introduced, not established.

Diomus sp.: Lai et al., 1986: 31; DoA.

Origin: Panama 1931 (as Diomus sp.) Lai et al., 1986: 31; DoA.
Intended target pest: *Dysmicoccus brevipes* (Cockerell): Lai *et al.*, 1986: 31; DoA.
Collections: none.
Island distribution: none.

50. *Diomus* sp.
Adventive introduction, not established.
Origin: none.
Intended target pest: none.
Collections: none.
Island distribution: Oahu.
Discussion: Mau (1977a: 399) reported “Two adults of this coccinellid (new to Hawaii) were collected by G. Funasaki from grass at Hickam Air Force Base, Oahu in August 1973. In May 1974 four adults were collected from Bermuda grass at Aiea, Oahu. Since then numerous adults have been collected during detection surveys of Hickam AFB. With the discovery of this new coccinellid, there are now two unidentified species of *Diomus* in Hawaii. They are easily distinguished by the degree of pubescence on the elytra. The new *Diomus* is distinctly less pubescent than the other species which has been known here since 1932. No information is available on the host preference of this new coccinellid. Determination was made by Dr. R. D. Gordon, USDA Systematic Entomology Laboratory.” Species establishment is dubious at best and therefore not considered established.

51. *Egius platycephalus* Mulsant
Purposely introduced, not established.

scales (Coccidae & Diaspididae): Lai *et al.*, 1986: 33; DoA.
Collections: none.
Island distribution: none.

52. *Erithionyx lanosus* (Blackburn)
Purposely introduced, not established.
*Erithionyx lanosus* (Blackburn, 1892a: 71): Correct spelling of genus.

Origin: Australia 1894 (as *Eritionyx lanosus* (Blackburn)): (misspelling) Marsden, 1894: 32.
Intended target pest: Diaspidinai: Marsden, 1894: 32.
Collections: none.
Island distribution: none.
Discussion: Slipinski (2007: 131) provided the correct spelling of the genus. Also note that this may be a misidentification of a *Rhyzobius* species as the genera can be difficult to differentiate and Marsden (1894) also lists a number of *Rhyzobius* (*Rhizobius*) species as having been introduced from Australia in 1894.

53. *Exochomus melanocephalus* (Zoubkoff)
Quarantine, not established.

*Exochomus nigromaculata*: (misidentification) Fullaway, 1925: 32; Fullaway, 1926: 48; BMASC.
**Exochomus nigromaculatus**: (misidentification) Fullaway, 1927: 47; Swezey, 1931c: 373; Lai *et al.*, 1986: 36; DoA.

Origin: British Guiana and California of South Africa species 1924 (as *Exochomus nigromaculata*):
Fullaway, 1925: 32.

South Africa 1924; California 1924 (as *Exochomus nigromaculatus*): Lai *et al.*, 1986: 36; DoA.
South Africa via California 1924 (as *Exochomus nigromaculatus*): Swezey, 1931c: 373.

Intended target pest: aphids: Lai *et al.*, 1986: 36; DoA.

Collections: UH (all from California, 1924).

Island distribution: none.

Discussion: Sorting out of the correct name for this species is made difficult by lack of specimens to refer to. However, literature can be used to bring some degree of confidence in what was introduced to Hawaii. First, while Nishida (2000: 51) lists only *E. melanocephalus*, the BMASC lists it and shows *E. nigromaculata* as a synonym. Both lists show the species to be “quarantine.” Neither of these provide information on where the species was introduced from or intended host. Second, the DoA records are for *E. nigromaculatus* and provide the origin and host. Gordon (1985: 18) shows that *E. melanocephalus* was introduced to California from South Africa in 1924 which coincides with the DoA records for *E. nigromaculatus* leading to the assumption that they are all referring to *E. melanocephalus*.

54. **Halmus chalybeus** (Boisduval)

*Purposely introduced, established.*

**Halmus chalybeus** (Boisduval, 1835: 595): Nishida, 2002: 51; BMASC.


*Coccinella chalybea* Boisduval: BMASC.

*Orchus chalybeus* Boisduval: (misspelling) Silvestri, 1910: 308.


*Orcus chalybeus* Kotsinsky, 1905a: 157; Kirkaldy, 1907a: 100; Fullaway, 1909: 25; Silvestri, 1910: 308; Bryan, 1915: 394; Fullaway, 1920: 246; Perkins, 1925: 360; Perkins, 1943: 2; Leeper, 1976: 291; Tavares *et al.*, 2013: 2; BMASC.

*Orcus chalybeus* Poisd.: (misspelling) Kotsinsky, 1906c: 419.

*Orcus chalybeus* (Kirkaldy, 1909a: 412.

Origin: Australia 1884 (as *Orcus chalybaeus* (Boisduval)): Swezey, 1923b: 300; Swezey, 1925c: 370; Timberlake, 1927: 532; Swezey, 1931c: 369; Leeper, 1976: 291.

Australia 1894 (as *Orcus chalybeus* (Boisduval)): Krauss, 1945: 76; Leeper, 1976: 291; Lai *et al.*, 1986: 55; DoA.

Australia 1894 (as *Orcus chalybeus* Boisduval): Marsden, 1894: 32.

Australia 1894 (as *Orcus chalybeus*): Fullaway, 1920: 246.

Australia 1895 (as *Orcus chalybeus* Boisduval): Illingworth, 1929: 248.

Australia 1894 (as *Orcus chalybeus*): Kotsinsky, 1905a: 157; Fullaway, 1920: 246.

Australia, no date (as *Orcus chalybeus* (Boisduval)): Swezey, 1925d: 364.
No Origin (as *Orcus chalybeus* (Boisduval)): Funasaki *et al.*, 1988: 118.
Intended target pest: armored scales: Lai *et al.*, 1986: 55; DoA.
Diaspine scales: Swezey, 1923b: 300; Swezey, 1925c: 370; Swezey, 1925d: 364.
Collections: BM, DoA, UH.
Island distribution: Kauai, Oahu, Molokai, Lanai, Maui, Hawaii.

55. *Halmus coelestris* (Blackburn)
Purposely introduced, not established.
*Halmus coelestris* (Blackburn, 1891: 153): This is the first time this name has been used in refereeing to a species introduced to Hawaii. See discussion below.
*Orcus ovalis* Blackburn: Nishida, 2002: 52; BMASC.
Origin: none.
Intended target pest: none.
Collections: none.
Island distribution: none.
Discussion: Slipinski & Giorgi (2006: 276) synonymize *Orcus coelestris* Blackburn with *Halmus coelestris* (Blackburn).

56. *Harmonia axyridis* (Pallas)
Purposely introduced, not established.
Origin: Japan 1895 (as *Harmonia axyridis* (Pallas)): Timberlake, 1943: 17.
Intended target pest: none.
Collections: none.
Island distribution: none.

57. *Harmonia conformis* (Boisduval)
Purposely introduced, established.
*Callineda conformis*: BMASC.
*Coccinella conformis* Boisduval: Leeper, 1976: 293.
*Coccinella conformis*: Kirkaldy, 1907a: 101; Leeper & Beardsley, 1975: 7; Leeper, 1976: 293; BMASC.
*Leis conformis* Boisduval: Koebele, 1897a: 76; Koebele, 1897b: 118; Koebele, 1898a: 217; Kotinsky, 1906e: 118.
*Leis conformis*: Kirkaldy, 1905: 153; Perkins, 1943: 3; BMASC.
Australia, before 1894 1904 (as *Callineda conformis* (Boisduval)) Disappeared after 1906: Swezey, 1923b: 301; Swezey, 1925c: 371.

[28]
Australia, before 1894 (as Callineda conformis (Boisduval) Disappeared after 1906): Swezey, 1925c: 371; Swezey, 1931c: 370.
Australia 1894 (as Harmonia conformis (Boisduval)): Timberlake, 1943: 17.
Australia 1904 (as Leis conformis): Kotinsky, 1905a: 153.
Australia via California 1973 (as Harmonia conformis (Boisduval)): Leeper & Beardsley, 1975: 7; Nakao et al., 1975: 111; Leeper, 1976: 293.
Australia 1894 1904 (as Harmonia conformis (Boisduval)): Lai et al., 1986: 39; DoA.
Australia via California 1973 (as Harmonia conformis (Boisduval)): Lai et al., 1986: 39; DoA.
No Origin 1973 (as Harmonia conformis (Boisduval)): Funasaki et al., 1988: 116.

Collections: BM, DoA, UH.
Island distribution: Maui, Hawaii.
Discussion: The first two introductions failed to establish, the introduction 1973 achieved establishment. Leeper (1976: 293) stated “I worked with this species in the laboratory and found that it would feed on a wide range of aphids but did not survive more than three generations feeding solely on aphids. This is probably why Harmonia conformis did not become established prior to the accidental introduction of Psylla uncatoides.”

58. Harmonia dimidiata (Fabricius)
Purposely introduced, not established.
Harmonia dimidiata (Fabricius, 1781): This is the first time where the species description is attributed to Fabricius.
Harmonia dimidiata (Mulsant): see Discussion below.
Origin: none.
Intended target pest: none.
Collections: BM.
Island distribution: Oahu.
Discussion: The Bishop Museum collection has 12 specimens of H. dimidiata collected on Oahu in 1925 with a note that they were determined by M. Myatake in 1965.

59. Harmonia octomaculata (Fabricius)
Purposely introduced, not established.
Harmonia octomaculata (Fabricius, 1781: 97): Nishida, 2002: 51; BMASC.
Coccinella arcuata Fabricius: Swezey, 1925c: 374, Swezey, 1931c: 373; Pemberton, 1948: 76; Lai et al., 1986: 23; DoA.
Coccinella arcuata: Kirkaldy, 1907b: 80; Williams, 1920: 332; BMASC.
Harmonia arcuata: Fullaway, 1952: 104; BMASC.
Scymnus arcuata: Kirkaldy, 1907b: 80.
Origin: Australia 1919 (as Coccinella arcuata Fabricius): Swezey, 1925c: 374; Swezey, 1931c: 373; Lai et al., 1986: 23; DoA.
Guam 1936 (as Harmonia arcuata (Fabricius)): Swezey et al., 1939: 350; Lai et al., 1986: 39; DoA.
Guam 1936 (not established) and Canton 1957 (as *Harmonia arcuata* (Fabricius)): Weber, 1957: 313.


*Aphis*: Swezey *et al.*, 1939: 350
aphids: Lai *et al.*, 1986: 23 and 39; DoA.

Collections: none.
Island distribution: none.

**60. Harmonia dinaria** (Mulsant)
Purposely introduced, not established.
*Harmonia testudinaria* (Mulsant, 1850: 300): Nishida, 2002: 51; BMASC.


*Neda testudinaria* (Mulsant): Swezey, 1925c: 374, BMASC, DoA.

*Neda testudinaria* Mulsant: Swezey, 1925c: 374; Swezey, 1931c: 373; Lai *et al.*, 1986: 49; DoA.

Origin: Australia 1904 (as *Neda testudinaria* Mulsant): Swezey, 1925c: 374; Swezey, 1931c: 373; Lai *et al.*, 1986: 49; DoA.

Australia 1904 (as *Callineda testudinaria* Mulsant): Swezey, 1905: 224.

Australia 1905 (as *Callineda testudinaria*): Terry, 1906: 12.

Intended target pest: plant lice and young leafhoppers: Swezey, 1925c: 374.
aphids: Lai *et al.*, 1986: 49; DoA.

Collections: BM, UH.
Island distribution: Oahu.
Discussion: The UH collection contains one specimen from Australia 1904 and other specimens labeled as having been bred in Hawaii in 1905. The BM collection contains three specimens collected on Oahu in 1905.

**61. Harmonia testudinea** (Wollaston)
Purposely introduced, not established.


*Adalia testudinea* (Wollaston): BMASC.


Intended target pest: none.
Collections: none.
Island distribution: none.

**62. Hippodamia convergens** Guerin-Meneville
Purposely introduced, established.


Beardsley, 1976: 314; Mau, 1977c: 413; Davis, 1979: 19; Lai et al., 1986: 40; Funasaki et al., 1988: 116; DoA. 
_Hippodamia convergens_: Kotinsky, 1906e: 117; Silvestri, 1910: 313; Ehrhorn, 1910b: 79; Ehrhorn, 1910c: 116; Ehrhorn, 1910e: 310; Ehrhorn, 1911b: 143; Fullaway, 1952: 104; Gagne, 1979: 71; Anonymous, 2006: 3; DoA  
California 1910 (as _Hippodamia convergens_): Ehrhorn, 1910b: 79.  
California 1911 (as _Hippodamia convergens_): Ehrhorn, 1911b: 143.  
Intended target pest: plant lice: Swezey, 1925c: 373.  
Collections: BM, DoA, UH.  
Island distribution: Niihau, Kauai, Oahu, Molokai, Lanai, Maui, Hawaii  

63. _Hippodamia quinquesignata ambigua_ LeConte  
Purposely introduced, established.  
_Hippodamia quinquesignata ambigua_ LeConte, 1852: 131: Leeper, 2014: 3.  
_Hippodamia 5-signata_: Leeper, 2014: 3; BMASC.  
_Hippodamia ambigua_ LeConte: Swezey, 1925c: 374; Swezey, 1931c: 373; Lai et al., 1986: 40; Nishida, 2002: 51; Leeper, 2014: 3; BMASC; DoA.  
_Hippodamia ambigua_: Kotinsky 1906e: 117; Silvestri, 1910: 313.  
_Hippodamia quinquesignata_: Fullaway, 1952: 104; Leeper, 2014: 3; BMASC.  
_Hippodamia quinquesignata_ subsp. _punctulata_ LeConte: Leeper, 2014: 3.  
_Hippodamia quinquesignata_ subsp. _punctulata_: Leeper, 2014: 3; BMASC.  
_Hippodamia 5-signata subsp. punctulata_: BMASC.  
California 1905 (as _Hippodamia ambigua_ LeConte): Swezey, 1925c: 374; Swezey, 1931c: 373; Lai et al., 1986: 40; DoA.  
Collections: DoA, UH.  
Island distribution: Oahu, Maui, Hawaii.
64. *Hippodamia sinuata* Mulsant
Purposely introduced, not established.

*Hippodamia sinuata* Mulsant, 1850: 1011; Koebele, 1894: 102; Nishida, 2002: 51; BMASC.
Collections: none.
Island distribution: none.

65. *Hippodamia variegata* (Goeze)
Purposely introduced, not established.

*Hippodamia variegata* (Goeze, 1777: 246): Nishida, 2002: 51; BMASC; DoA.

*Adonia variegata* Goeze: Davis & Krauss, 1963: 248, BMASC.
Madeira 1962 (as *Hippodamia variegata* (Goeze)): Lai et al., 1986: 1; DoA.
Intended target pest: aphids: Lai et al., 1986: 1; DoA.
Collections: none.
Island distribution: none.

66. *Hyperaspidius comparatus* Casey
Purposely introduced, not established.

*Hyperaspidius comparatus* Casey, 1899: 246: Koebele, 1907: 159; Swezey, 1925c: 373; Chapman, 1938: 320; Lai et al., 1986: 42; Gonzalez-Hernandez, 1995: 11; Nishida, 2002: 51; BMASC; DoA.
Origin: California 1893 (as *Hyperaspidius comparatus* Casey): Swezey, 1925c: 373; Swezey, 1931c: 372; Chapman, 1938: 320; DoA.

No Origin 1893 (as *Hyperaspidius comparatus* Casey): Koebele, 1907: 159.
Intended target pest: mealybugs: Swezey, 1925c: 373; Lai et al., 1986: 42; DoA.

Collections: none.
Island distribution: none.

Discussion: Gordon (1985: 386) points out that *Hyperaspidius trimaculatus* is tropical American species and that the correct species in California is *Hyperaspidius vittigerus* (LeConte).

67. *Hyperaspidius vittigerus* (LeConte)
Purposely introduced, not established.

*Hyperaspidius vittigerus* (LeConte, 1852: 133): This is the first time this name has been used in refereeing to a species introduced to Hawaii. See discussion below.

Collections: none.
Island distribution: none.
Discussion: Gordon (1985: 386) points out that *Hyperaspidius trimaculatus* is tropical American species and that the correct species in California is *Hyperaspidius vittigerus* (LeConte).

68. *Hyperaspis albicollis* Gorham
Purposely introduced, not established.


Dysmicoccus brevipes (Cockerell): Lai et al., 1986: 42; DoA.


Collections: none.

Island distribution: none.

69. Hyperaspis annularis Boheman

Introduction dubious, not established.

Hyperaspis annularis Boheman, 1859: 201: Nishida, 2002: 51; BMASC.


Origin: none.

Intended target pest: none.

Collections: none.

Island distribution: none.

Discussion: Very little can be found on this species. Gordon (1985: 404) states that “H. annularis Boheman does not occur north of Mexico” even though Boheman (1859: 201) and Illingworth (1923: 24) mention the species in both Hawaii and California. Dobzhansky (1941: 184) provides its geographical distribution as only California.

70. Hyperaspis c-nigrum Mulsant

Purposely introduced, not established.

Hyperaspis c-nigrum Mulsant, 1850: 649: Chapman, 1938: 325; Swezey et al., 1939: 352; Nishida, 2002: 51; BMASC.

Hyperaspis c-nigrum: Lai et al., 1986: 42; DoA.


Hesperaspis c-nigrum Mulsant: (misspelling) Pandey, 2002: 27.


Origin: Brazil 1935 (as Hyperaspis c-nigrum): Lai et al., 1986: 42; DoA.


Brazil 1935 1936 (as Hyperaspis c-nigrum Mulsant): Chapman, 1938: 325; Swezey et al., 1939: 352.


Intended target pest: Pseudococcus brevipes: Chapman, 1938: 325; Swezey et al., 1939: 352.

Dysmicoccus brevipes (Cockerell): Lai et al., 1986: 42; DoA.

Collections: none.

Island distribution: none.

71. Hyperaspis inflexa Casey

Purposely introduced, established.

Hyperaspis inflexa Casey, 1899: 126. This is the first time this name has been used in refereeing to a species introduced to Hawaii. See discussion below.
Hyperaspis fimbriolata Mulsant: Koebele, 1894: 103.  
Hyperaspis limbalis: Beardsley, 1967: 338; BMASC.  
Hyperaspis limbatus: Beardsley, 1963: 195; BMASC.  

Origin: California 1893 1906 (as Hyperaspis fimbriolata Melsheimer): Lai et al., 1986: 42; DoA.  
California 1894 (as Hyperaspis fimbriolata Mulsant): Koebele, 1894: 103.  
California 1906 but not found established until 1954 (as Hyperaspis limbalis Casey (?)): Beardsley, 1967: 338.  
No Origin 1893 (as Hyperaspis limbatus Casey): Koebele, 1907: 159.  
No Origin 1906 (as Hyperaspis fimbriolata Melsheimer): Funasaki et al., 1988: 123.  

Intended target pest: mealybugs: Swezey, 1925c: 374; Lai et al., 1986: 42; DoA.  
Lecanium and Dacty lopius: Koebele, 1894: 103.  

Collections: BM, DoA, UH.  
Island distribution: Oahu, Maui, Hawaii.  
Discussion: Dobzhansky (1941: 54) synonymizes of Hyperaspis limbalis with Hyperaspis fimbriolata.  
Hyperaspis limbatus is a misspelling of Hyperaspis limbalis (Leeper 1976: 295). Gordon (1985: 488-489) states “This species has long been misidentified by coccinellid workers (see discussion under H. inflexa), but an examination of the types has resulted in the correct application of the name H. fimbriolata. Part of the problem has been the scarcity of specimens of the true H. fimbriolata in collections, and it now appears that this species is restricted to more or less coastal areas from Pennsylvania to Florida and Mississippi.” This rules out the species in Hawaii being H. fimbriolata. In discussing H. inflexa, Gordon (1985: 491) states “Because of the variable color pattern of the elytron, wide distribution, and the close morphological similarity in other respects of H. inflexa to H. sanctaeritae and H. caseyi, n. sp., it is imperative that male genitalia be examined in order to identify the species. The basal lobe of the male genitalia of H. inflexa consistently has the lateral projection blunt and in the apical half. The name fimbriolata Melsheimer has been invariably applied to this species by authors since Melsheimer’s original description (see discussion under H. fimbriolata). That name refers to another species, therefore I use the next available name, H. inflexa, which Casey used to describe a form of what was then considered to be H. fimbriolata. The male genitalia do not vary significantly, and the different color patterns of H. inflexa do not occur in a pattern that permits the use of discrete subspecies, therefore, I do not follow the classification proposed by Dobzhansky (1941) where this species is concerned.” This makes it necessary for a comparison of male genitalia from species found in California, the origin of the species introduced to Hawaii, to verify the correct species established in Hawaii.

72. Hyperaspis japonica (Crotch)  
Purposely introduced, not established.  
Hyperaspis japonica (Crotch, 1874: 203): Swezey, 1925c: 373; Swezey, 1931c: 373; Chapman, 1938: 320; Lai et al., 1986: 42; Nishida, 2002: 51; DoA.

Origin: Japan 1895 (as *Hyperaspis japonica* (Crotch)): Swezey, 1925c: 373; Swezey, 1931c: 373; Lai *et al.*, 1986: 42; DoA.

California 1895 (as *Hyperaspis japonica* (Crotch)): Chapman, 1938: 320.

California 1895 (as *Hyperaspis japonica*): Gonzalez-Hernandez, 1995: 11.

Intended target pest: mealybugs: Swezey, 1925c: 373; Lai *et al.*, 1986: 42; DoA.


Collections: none.

Island distribution: none.

### 73. Hyperaspis lateralis Mulsant

**Purposely introduced, not established.**


Origin: California 1896 and Mexico 1902, 1906 (as *Hyperaspis lateralis* Mulsant): Swezey, 1925c: 373; DoA.


Mexico 1902, (as *Hyperaspis lateralis*): Perkins & Swezey, 1924: 27.


No Origin 1896 (as *Hyperaspis lateralis* Mulsant): Koebele, 1897b: 132.

No Origin 1906 (as *Hyperaspis lateralis* Mulsant): Craw, 1907: 150.

No Origin 1906 (as *Hyperaspis lateralis*): Craw, 1907: 156.

Intended target pest: mealybugs: Lai *et al*. 1986: 42; DoA.

Collections: none.

Island distribution: none.

### 74. Hyperaspis octonotata Casey

**Purposely introduced, not established.**

*Hyperaspis octonotata* Casey, 1899: 121: Nishida, 2002: 51; BMASC.

*Hyperaspis 8-notata* Casey: Swezey, 1925c: 374; Swezey, 1931c: 373; Chapman, 1938: 321; Lai *et al.*, 1986: 43; BMASC; DoA.

Origin: Mexico 1907 (as *Hyperaspis 8-notata* Casey): Swezey, 1925c: 374; Swezey, 1931c: 373; Chapman, 1938: 321; Lai *et al.*, 1986: 43; DoA.


mealybugs: Lai *et al.*, 1986: 43; DoA.


Collections: none.

Island distribution: none.

### 75. Hyperaspis osculans LeConte

**Purposely introduced, not established.**

*Hyperaspis osculans* LeConte, 1880: 187: Koebele, 1894: 103; Nishida, 2002: 51; BMASC.
Intended target pest: Lecanium and Dactylipus.
Collections: none.
Island distribution: none.

76. *Hyperaspis oculaticauda* Casey

*Purposely introduced, not established.*

*Hyperaspis oculaticauda* Casey, 1899: 649: This is the first time this name has been used in refereeing to a species introduced to Hawaii. See discussion below.

*Hyperaspis depressa* Casey: (misnomer) Koebele, 1907: 159; Swezey, 1925c: 373; Swezey, 1931c: 372; Chapman, 1938: 320; Lai et al., 1986: 42; Gonzalez-Hernandez, 1995: 11; BMASC; DoA.

*Hyperaspis subdepressa* Casey: Nishida, 2002: 51; BMASC.


No Origin 1893 (as Hyperaspis depressa Casey): Koebele, 1907: 159.

Intended target pest: mealybugs: Swezey, 1925c: 373; Lai et al., 1986: 42; DoA.


Collections: none.
Island distribution: none.
Discussion: Gordon (1985: 526) synonymizes *Hyperaspis subdepressa* with *Hyperaspis oculaticauda*.

77. *Hyperaspis pantherina* Fursch

*Purposely introduced, established.*

*Hyperaspis pantherina* Fursch, 1975: 43: Nishida, 2002: 51; Leeper, 2014: 3; BMASC; DoA.


Origin: Mexico 1907 (as Hyperaspis jocosa (Mulsant)): (misidentified) Zimmerman, 1948c: 140.

Mexico 1908 (as Hyperaspis jocosa (Mulsant)): (misidentified) Swezey, 1923b: 300; Swezey, 1925c: 370; Swezey, 1925d: 366; Pemberton & Williams, 1938: 217; Swezey, 1943b: 6; Fullaway & Krauss, 1945: 76.

Mexico 1908 (as Hypercaspis jocosa (Mulsant)): (misidentified, misspelling) Swezey, 1931c: 369; Lai et al., 1986: 42.


Mexico 1908 (as Hypercaspis pantherina Fursch): DoA.

No Origin 1908 (as Hyperaspis jocosa (Mulsant)): Funasaki et al., 1988: 116.

Intended target pest: *Orthezia insignis* Browne: DoA.


*Orthezia*: Swezey, 1923b: 300; Swezey, 1925c: 370.

Collections: BM, DoA, UH.
Island distribution: Kauai, Oahu, Molokai, Lanai, Maui, Hawaii.

[36]
Discussion: Leeper (2014: 3) explained the misidentification of *Hyperaspis pantherina* as *Hyperaspis jocosa*.

### 78. *Hyperaspis postica* LeConte

**Purposely introduced, not established.**

*Hyperaspis postica* LeConte, 1880: 188; Koebele, 1907: 159; Swezey, 1925c: 373; Swezey, 1931c: 372; Chapman, 1938: 320; Lai et al., 1986: 43;

Gonzalez-Hernandez, 1995: 11; Nishida, 2002: 51; BMASC; DoA.

*Hyperaspis postica* Sec: Koebele, 1894: 103.

**Origin:** California 1893, 1906 (as *Hyperaspis postica* LeConte): Swezey, 1925c: 373; Swezey, 1931c: 372; Chapman, 1938: 320; Lai et al., 1986: 43;

Gonzalez-Hernandez, 1995: 11; DoA.

California 1894 (as *Hyperaspis postica* Sec.): Koebele, 1894: 103.

No Origin 1893 (as *Hyperaspis postica* LeConte): Koebele, 1907: 159.

**Intended target pest:** mealybugs: Swezey, 1925c: 373; Lai et al., 1986: 43; DoA.

*Lecanium* and *Dactylopius*: Koebele, 1894: 103.


Collections: none.

Island distribution: none.

### 79. *Hyperaspis sylvestrii* Weise

**Purposely introduced, established.**


*Hyperaspis sylvestrii* Fullaway, 1923a: 305; Fullaway, 1923b: 63-64; Fullaway, 1925: 31; Fullaway, 1933: 58.


**Origin:** Mexico 1922 (as *Hyperaspis sylvestrii* Weise): Swezey, 1923b: 300; Swezey, 1925b: 47; Swezey, 1925c: 370; Swezey, 1931c: 369; Chapman, 1938: 320; Swezey, 1948: 204; Pemberton, 1964a: 705; Lai et al., 1986: 43; Gonzalez-Hernandez, 1995: 11; DoA.

Mexico 1922 (as *Hyperaspis sylvestrii*): Osborn, 1938: 154.


**Intended target pest:** *Nipaecoccus nipae* (Maskell): Lai et al., 1986: 43; DoA.

*Pseudococcus nipae*: Fullaway, 1923b: 63; Swezey, 1923b: 300; Swezey, 1925c: 370; Fullaway, 1924a: 373.


Collections: BM, DoA, UH.

Island distribution: Oahu, Lanai, Maui, Hawaii.

### 80. *Hyperaspis* sp.

**Purposely introduced, not established.**

*Hyperaspis* sp.: Lai et al., 1986: 43; DoA.
Origin: Panama 1930 (as *Hyperaspis* sp.): Lai *et al.*, 1986: 43; DoA.
Intended target pest: mealybugs: Lai *et al.*, 1986: 43; DoA.
Collections: none.
Island distribution: none.

81. *Hyperaspis* sp.
Purposely introduced, not established.
*Hyperaspis* sp.: Lai *et al.*, 1986: 43; Pandey, 2002: 27; DoA.
Origin: Brazil 1935 (as *Hyperaspis* sp.): Lai *et al.*, 1986: 43; Pandey, 2002: 27; DoA.
Intended target pest: Dysmicoccus brevipes (Cockerell): Lai *et al.*, 1986: 43; DoA.
Collections: none.
Island distribution: none.

82. *Hyperaspis trilineata* Mulsant
Purposely introduced, not established.
Intended target pest: mealybugs.

*Saccharicoccus sacchari* (Cockerell): Lai *et al.*, 1986: 43; DoA.
Collections: none.
Island distribution: Oahu.

83. *Hyperaspis undulata* (Say)
Purposely introduced, not established.
*Hyperaspis undulata* (Say, 1824: 92): Swezey, 1925c: 373; Nishida, 2002: 51; BMASC; DoA.


*Hyperaspis undulata* Say: (misspelling) Koebele, 1897a: 75; Koebele, 1897b: 116; Koebele, 1898a: 216.
Origin: California 1894 (as *Hyperaspis undulata* Say): Koebele, 1894: 103; Swezey, 1925c: 373; Swezey, 1931c: 372; Chapman, 1938: 320; Lai *et al.*, 1986: 43; Gonzalez-Hernandez, 1995: 11; DoA
Intended target pest: mealybugs: Lai *et al.*, 1986: 43; DoA.

*Lecanium and Dacty lopius*: Koebele, 1894: 103.
Collections: none.
Island distribution: none.

84. *Illeis galbula* (Mulsant)
Purposely introduced, not established.
*Illeis galbula* (Mulsant, 1850: 166): Timberlake, 1943: 43
Collections: none.
Island distribution: none.

85. Lemnia biplagiata (Swartz)
Purposely introduced, not established.
Lemnia biplagiata (Swartz in Schonherr, 1808: 196): This is the first time this name has been used in refereeing to a species introduced to Hawaii. See discussion below.
   Coelophora biplagiata (Swartz): Nishida, 2002: 51; BMASC.
   Coelophora biplagiata Swartz: Koebele, 1897a: 78; Koebele, 1897b: 120; Koebele, 1898a: 218; Swezey, 1923b: 301; Swezey, 1925c: 371; Swezey, 1931c: 370; Lai et al., 1986: 24; DoA
   Coelophora biplagiata: BMASC.
Origin: Hong Kong 1895 (as Coelophora biplagiata Swartz): Koebele, 1897b: 120; Swezey, 1923b: 301; Swezey, 1925c: 371; Lai et al., 1986: 24; DoA.
   Hong Kong 1895 (as Coelophora biplagiata Swartz, Disappeared after 1896): Swezey, 1925c: 371; Swezey, 1931c: 370.
   aphids: Lai et al., 1986: 24; DoA.
Collections: none.
Island distribution: none.

86. Mada desarmata (Mulsant)
Purposely introduced, not established.
Mada desarmata (Mulsant, 1850: 928): This is the first time this name has been used in refereeing to a species introduced to Hawaii. See discussion below.
   Ladoria desarmata Mulsant: Lai et al., 1986: 44; Nishida, 2002: 51; BMASC; DoA.
   Ladoria desarmata: Swezey et al., 1939: 351; Fullaway, 1952: 104.
Origin: Brazil 1936 (as Ladoria desarmata): Swezey et al., 1939: 351.
   Brazil 1936 (as Ladoria desarmata Mulsant): Lai et al., 1986: 44; DoA.
Intended target pest: diaspine coccid: Swezey et al., 1939: 351.
   scales (Diaspididae & Coccidae): Lai et al., 1986: 44; DoA.
Collections: none.
Island distribution: none.
Discussion: Gordon (1975:222) declared a new combination of Mada desarmata (Mulsant) with Ladoria desarmata (Mulsant).

87. Megalocaria fijiensis (Crotch)
Purposely introduced, not established.
Megalocaria fijiensis (Crotch, 1874: 22): Nishida, 2002: 51; BMASC; DoA.
   Megalocaria tricolor (Fabricius):
   Megalocaria tricolor Fabricius: Koebele, 1901: 299.
   Archaioneda tricolor: Kirkaldy, 1909b: 52; BMASC.
   Archaioneda tricolor subsp. fijiensis: BMASC.
   Archaioneda tricolor var. fijiensis Crotch: Craw, 1907: 152; Swezey, 1925c: 374; Swezey, 1931c: 373.

Archaioneda fijiensis: Craw, 1907: 152; Swezey, 1925c: 374; Lai et al., 1986: 1; DoA.

Origin: Fiji 1906 (as Archaioneda tricolor var. fijiensis Crotch): Craw, 1907: 152; Swezey, 1925c: 374; Swezey, 1931c: 373.

Fiji 1906 1960 (as Archaioneda tricolor fijiensis Crotch): Lai et al., 1986: 1; DoA.


Intended target pest: plant lice and young leafhoppers: Swezey, 1925c: 374.

Coccus viridis (Green) (green scale): Davis, 1961b: 391.

scales (Diaspididae & Coccidae): Lai et al., 1986: 1; DoA.

Collections: UH (see Discussion).

Island distribution: Kauai, Oahu, Maui, Hawaii.

Discussion: The UH collection contains 12 specimens of *M. fijiensis* all labeled as having been reared in 1906 or 1960.

88. *Menochilus sexmaculata* (Fabricius)

_Purposefully introduced, not established._


_Chilomenes sexmaculatus*_: BMASC.


*Chilomenes quartriplagiata* Swartz: (misspelling) Koebele, 1897a: 78; Koebele, 1897b: 120; Koebele, 1898a: 218.

*Menochilus sexmaculatus* Fabricius: Lai et al., 1986: 47; DoA.

Origin: Hong Kong 1895 (as *Chilomenes quadriplagiata* Swartz): Koebele, 1897b: 120.

Taiwan 1971 (as *Menochilus sexmaculatus* Fabricius): Lai et al., 1986: 47; DoA.

Taiwan 1971 (as *Menochilus sexmaculatus* (Fabricius)): Davis, 1972: 188.

Intended target pest: aphids: Lai et al., 1986: 47; DoA.

Collections: none.

Island distribution: Oahu.

Discussion: Poorani (2002: 19) recognizes both *Menochilus sexmaculatus* and *Chilomenes quadriplagiata* as synonyms of *Chilomenes sexmaculata*. However, Slipski (2007: 169-171) recognizes all of the above as *Menochilus sexmaculata*. Although Nishida (2002: 51) shows *Menochilus sexmaculata* as present on Oahu, none of the three museums have specimens in their collections. The species establishment is dubious at best and therefore not considered established.

89. *Micraspis crocea* (Mulsant)

_Purposefully introduced, not established._

*Micraspis crocea* (Mulsant, 1866: 512): This is the first time this name has been used in refereeing to a species introduced to Hawaii. See discussion below.

*Verania crocea* (Mulsant): Davis, 1959: 64; Lai et al., 1986: 77; Nishida, 2002: 50; BMASC; DoA.

Origin: Philippines 1958 (as *Verania crocea* (Mulsant)): Davis, 1959: 64; Lai et al., 1986: 77; DoA.

Intended target pest: *Aphis gossypii* Glover: Davis, 1959: 64.

aphids: Lai et al., 1986: 77; DoA.

Collections: none.

Island distribution: none.

90. *Micraspis discolor* (Fabricius)
Purposely introduced, not established.
*Micraspis discolor* (Fabricius, 1798: 77): Nishida, 2002: 51; BMASC.
*Verania discolor* Fabricius: Koebele, 1897a: 78; Koebele, 1897b: 120; Swezey, 1923b: 301; Swezey, 1925c: 371; Swezey, 1931c: 370; Davis, 1972: p. 188; Lai *et al*., 1986: 77; DoA.
*Verania discolor*: BMASC.
Origin: Hong Kong 1895, Taiwan 1971 (as *Verania discolor* Fabricius): Lai *et al*., 1986: 77; DoA.
Hong Kong 1895 (as *Verania discolor* Fabricius, disappeared after 1896): Swezey, 1923b: 301; Swezey, 1925c: 371; Swezey, 1931c: 370.
Taiwan 1971 (as *Verania discolor* Fabricius): Davis, 1972: 188.
aphids: Lai *et al*., 1986: 77; DoA.
Collections: none.
Island distribution: Oahu.

**91. Micraspis frenata** (Erichson)
Purposely introduced, not established.
*Micraspis frenata* (Erichson, 1842: 239): This is the first time this name has been used in refereeing to a species introduced to Hawaii. See discussion below.
*Alesia frenata*: Terry, 1904b: 475.
*Verania frenata* (Erichson): Swezey, 1925c: 374; Swezey, 1931c: 373; Lai *et al*., 1986: 77; DoA.
*Verania frenata* Erichson: Swezey, 1905: 229; Fullaway *et al*., 1922: 27.
*Verania frenata*: Perkins, 1906b: 504; Kirkaldy, 1909b: 56; Silvestri, 1910: 313; BMAC.
Origin: Australia 1904 (as *Alesia frenata*): Terry, 1904b: 475.
Australia 1904 (as *Verania frenata*): Kotinsky, 1905a: 153 & 156.
Australia 1904 (as *Verania frenata* (Erichson)): Swezey, 1925c: 374; Swezey, 1931c: 373; Lai *et al*., 1986: 77; DoA.
Intended target pest: plant lice and young leafhoppers: Swezey, 1925c: 374.
aphid spp.: Lai *et al*., 1986: 77; DoA.
Collections: none.
Island distribution: none.
Discussion: Slipinski (2007: 174) showed *Alesia frenata* and *Verania frenata* to be synonyms of *Micraspis frenata*.

**92. Micraspis furcifera** (Guerin-Meneville)
Purposely introduced, not established.
*Micraspis furcifera* (Guerin-Meneville, 1835: 152): Nishida, 2002: 51; BMASC.
*Verania furcifera*: Kirkaldy, 1909b: 56; BMASC.
Origin: none
Intended target pest: none.
Collections: none.
Island distribution: none.
Discussion: Slipinski (2007: 174) shows *Micraspis furcifera* (Guerin-Meneville) as an Australian species with *Verania furcifera* as a synonym.
93. *Micraspis lineata* (Thunberg)

Purposely introduced, not established.


*Micraspis striata* (Fabricius): Nishida, 2002: 51; BMASC.


Origin: Africa 1957 (as *Alesia striata* (Fabricius)): Lai *et al.*, 1986: 1; DoA.


Intended target pest: plant lice and young leafhoppers: Swezey, 1925c: 374.

aphid spp.: Davis, 1958:358; Lai *et al.*, 1986: 1; DoA.

Collections: none.

Island distribution: none.


94. *Micraspis lineola* (Fabricius)

Purposely introduced, not established.

*Micraspis lineola* (Fabricius, 1775: 79): Nishida, 2002: 51; BMASC.

*Verania lincola* Fabricius: (misidentification/misspelling) Swezey, 1905: 231.

*Verania lineata* (Fabricius): (misidentification/misspelling) Marsden, 1894: 31 (see Discussion).

*Verania lineola* (Fabricius): Swezey, 1925c: 374; Swezey, 1931c: 373; Timberlake, 1943: 27-28; Lai *et al.*, 1986: 77; DoA.


*Verania lineola*: Terry, 1904b: 476; Craw, 1906b: 151; Perkins, 1906a: xvii; Perkins, 1906b: 504; Kirkaldy, 1909a: 417; Silvestri, 1910: 313; BMASC.


Origin: Australia 1904; Fiji 1906 (as *Verania lineola* (Fabricius)): Lai *et al.*, 1986: 77; DoA.

Australia, Fiji 1904, 1906 (as *Verania lineola* (Fabricius)): Swezey, 1925c: 374; Swezey, 1931c: 373.

Australia 1904 (as *Verania lineola*): Terry, 1904b: 476.

Australia 1904 (as *Verania lincola* Fabricius): Swezey, 1905: 231.


Intended target pest: plant lice and young leafhoppers: Swezey, 1925c: 374.

aphids: Lai *et al.*, 1986: 77; DoA.

Collections: none.

Island distribution: Oahu, Hawaii.

Discussion: Marsden (1894: 31) must be a misidentification or misspelling of *Verania lineola* because *Verania lineata* is not an Australian species (Slipinski, 2007: 174). Slipinski (2007: 174) also shows *Verania lineola* and *Verania strigula* as synonyms of *Micraspis lineola* (Fabricius).

95. *Micraspis* sp.

Purposely introduced, not established.

*Micraspis* sp.

*Verania* sp.: Davis, 1959: 64; Lai *et al.*, 1986: 77; Nishida, 2002: 50; DoA.

Origin: Philippines 1958 (as *Verania* sp.): Davis, 1959: 64; Lai *et al.*, 1986: 77; DoA.

Intended target pest: *Aphis* spp.: Davis, 1959: 64.

aphids: Lai *et al.*, 1986: 77; DoA.
Collections: none.
Island distribution: none.

96. **Mulsantina picta** (Randall)
Purposely introduced, not established.

*Mulsantina picta* (Randall, 1837: 51): Nishida, 2002: 51; BMASC.


*Harmonia picta* Boisduval: Koebele, 1897b: 131; Koebele, 1898b: 265.

*Harmonia picta* BMASC.


Collections: none.
Island distribution: none.

97. **Nephaspis bicolor** Gordon
Purposely introduced, established.


*Nephaspis bicolor*: Anonymous, 2006: 3; DoA

Origin: Trinidad 1979 (as *Nephaspis bicolor* Gordon): Lai et al., 1986: 49; DoA.


Intended target pest: *Aleurodicus dispersus* Russell: Lai et al., 1986: 49; DoA.

Collections: BM, UH.
Island distribution: Oahu.

Discussion: The UH has 9 specimens all collected in 1983 while the BM has 2 specimens collected on Midway Island.

98. **Nephaspis indus** Gordon
Purposely introduced, established.

*Nephaspis indus* Gordon, 1996: 43: This is the first time this name has been used in refereeing to a species introduced to Hawaii. See discussion below.

*Nephaspis oculatus* (Blatchley): (misspelling) Nishida, 2002: 52; BMASC.


*Nephaspis oculatus* (misspelling) Anonymous, 2006: 3

*Nephaspis indus* Gordon 1982 (incorrect date): Nishida, 2002: 52; BMASC.

*Nephaspis indus* Gordon: DoA.

Origin: Trinidad 1979; Honduras 1979 (as *Nephaspis indus* Gordon): DoA.


Intended target pest: *Aleurodicus dispersus* Russell: Lai et al., 1986: 49; DoA.

Collections: UH.
Island distribution: Kauai, Oahu, Molokai, Lanai, Maui, Hawaii.

Discussion: Nishida (2002: 52) mistakenly cited Gordon (1982) for naming this species. However, records show that Gordon (1997: 43) is the correct reference to the naming of *Nephaspis indus* Gordon. Gordon (1985: 102-104) declared a new combination of *Scymnus oculatus* Blatchley (=*Nephaspis oculatus*). [43]
Nephus roepkei (Fluiter)

Purposely introduced, established.


*Scymnus roepkei* (Fluiter): Funasaki *et al.*, 1988: 119; DoA.


*Scymnus bipunctatus* Kugelann: (misidentified) Zimmerman, 1948c: 250.


*Nephus* sp. near *bipunctatus* Kugelann: Swezey, 1923b: 300; Swezey, 1925c: 370;


Origin: Japan 1895; China 1906; Philippines 1914 (as *Scymnus bipunctatus*): (misidentified) Fullaway, 1920: 241.

Japan 1895; China 1906; Philippines 1914 (as *Scymnus roepkei* (Fluiter)): Lai *et al.*, 1986: 49; DoA.

Japan 1895; China 1906; Philippines 1914 (as *Nephus* sp. possibly *bipunctatus* (Kugelann)): Samuelson, 1998: 30.

Japan, China, Philippines 1895 1906 1914 (as *Nephus* sp. near *bipunctatus* Kugelann): Swezey, 1923b: 300; Swezey, 1925c: 370; Swezey, 1931c: 369; Chapman, 1938: 320.


No Origin 1895 (as *Scymnus roepkei* (Fluiter)): Funasaki *et al.*, 1988: 119.

Formosa 1933 (as *Nephus* sp. near *bipunctatus* Kugelann): Chapman, 1938: 323.

Saipan and Palau 1934 (as *Nephus* sp. near *bipunctatus* Kugelann): Chapman, 1938: 324.

Philippine 1906 (as *N. bipunctatus*): Gonzalez-Hernandez, 1995: 11;


Philippines 1958 (as *Scymnus roepkei* Fluiter): Davis, 1958, 64.

Intended target pest: mealybugs: Swezey, 1923b: 300; Swezey, 1925c: 370; Davis, 1958, 64; Lai *et al.*, 1986: 49; DoA.

*Pseudococcus brevipes*: Chapman, 1938: 320, 324, 326.

Collections: BM, DoA, UH.

Island distribution: Kauai, Oahu, Maui, Hawaii.

Discussion: Beardsley (1956: 18) cited a communication from Dr. Chapin on correcting the name from *Scymnus near bipunctatus* to *Scymnus roepkei* Fluiter. Error was due to a misidentification.

100. *Nephus* sp.

Purposely introduced, not established.


[44]
Intended target pest: *Pseudococcus bromeliae*: Swezey, 1923b: 300; Swezey, 1925c: 370.
Collections: none.
Island distribution: none.
Discussion: It is impossible to determine what this species was.

101. **Nephus (Sidis) binaevatus** (Mulsant)
Purposely introduced, not established.
*Nephus (Sidis) binaevatus* (Mulsant, 1850: 976): This is the first time this name has been used in refereeing to a species introduced to Hawaii. See discussion below.


Scymnus binaevatus: (misspelling) Fullaway, 1952: 104.

Origin: Africa via California 1948 (as Scymnus binaevatus (Mulsant)): Zimmerman, 1949: 341; DoA.
California 1948 (as Scymnus binaevatus (Mulsant)): Lai et al., 1986: 66.

Collections: none.
Island distribution: Oahu, Lanai.
Discussion: Gordon (1976: 284) declared the new combination *N. (Sidis) binaevatus*.

102. **Olla v-nigrum** (Mulsant)
Purposely introduced, established.
*Olla v-nigrum* (Mulsant, 1866: 64): Timberlake, 1943: 24; Swezey, 1954: 108; Nishida, 2002: 52; Starr et al., 2004: 51; BMASC.

*Olla v-nigrum*: Tavares et al., 2012: 1; Tavares et al., 2013: 3.
*Coccinella abdominalis* Mulsant: Krauss, 1944b: 86.
*Coccinella abdominalis*: Koebele, 1896: 597-598; Koebele, 1897b: 117; Koebele, 1898a: 215; Kotinsky, 1906a: 8; Kirkaldy, 1907a: 100; Fullaway, 1909: 25; Fullaway, 1912: 10; Leeper, 1976: 297; BMASC.
*Cycloneda abdominalis*: BMASC.
*Cycloneda oculata* Fabricius: Koebele, 1897b: 131.
*Cycloneda oculata* Fabricius: (misspelling) Koebele, 1898b: 265.
*Neda abdominalis*: Perkins, 1903: 17; Perkins, 1904: 497; Kirkaldy, 1909b: 55; Perkins, 1913: cx; BMASC.


*Olla abdominalis* Say: Takara et al., 1990: 28-29.
*Olla abdominalis*: Fullaway, 1920: 241; BMASC.
Olla abdominalis subsp. plagiata: BMASC.
Olla abdominalis sobrina Casey: Zimmerman, 1948c: 68.
Orcus abdominalis: BMASC.

Mexico 1900 (as Olla abdominalis Say): Lai et al., 1986: 50.
Mexico 1908 (as Olla abdominalis (Say)): DoA.
No Origin (as Olla abdominalis (Say)): Funasaki et al., 1988: 118.

Intended target pest: scales (Diaspididae & Coccidae): Lai et al., 1986: 50; DoA.
aphids and various lecanium: Koebele, 1894: 102.

Collections: BM, DoA, UH.
Island distribution: Kauai, Oahu, Molokai, Lanai, Maui, Hawaii.

103. Orcus australasiae (Boisduval)
Purposely introduced, not established.
Orcus australasiae (Boisduval, 1835: 593): Nishida, 2002: 52; BMASC.
Orcus australasia: (misspelling) Marsden, 1894: 32.
Orcus australasia Boisduval: (misspelling) Koebele, 1894: 104.
Orcus australasiae: Silvestri, 1910: 308.

Australia via California (as Orcus australasia Boisduval): Koebele, 1894: 104.

Intended target pest: Lecanidae: Marsden, 1894: 32.
various Coccids, such as Aspidinae and Lecanidinae: Koebele, 1894 104.

Collections: none.
Island distribution: none.

104. Orcus bilunulatus (Boisduval)
Purposely introduced, not established.
Orcus bilunulatus (Boisduval, 1835: 594): Swezey, 1925c: 374; Swezey, 1931c: 373; Lai et al., 1986: 55;
Nishida, 2002: 52, DoA.

Origin: Australia 1904 (as Orcus bilunulatus (Boisduval)): Swezey, 1925c: 374; Swezey, 1931c: 373; Lai et al., 1986: 55; DoA.

Intended target pest: plant lice and young leafhoppers: Swezey, 1925c: 374.
aphids: Lai et al., 1986: 55; DoA.

Collections: none.
Island distribution: none.

105. Orcus cyanocephalus Mulsant
Purposely introduced, not established.
Orcus cyanocephalus Mulsant, 1850: 467: Swezey, 1925c: 374; Swezey, 1931c: 373; Lai et al., 1986: 55;
Nishida, 2002: 52; BMASC; DoA.

Origin: Australia 1904 (as Orcus cyanocephalus): Terry, 1904b: 476.
Australia 1904 (as Orcus cyanocephalus Mulsant): Swezey, 1925c: 374; Swezey, 1931c: 373; Lai et al., 1986: 55; DoA.

Intended target pest: plant lice and young leafhoppers: Swezey, 1925c: 374.
aphids: Lai et al., 1986: 55; DoA.

Collections: none.
Island distribution: none.

106. **Orcus lafertei** Mulsant

**Purposely introduced, not established.**


Intended target pest: mealybugs: Lai et al., 1986: 55; DoA.

*Pseudococcus nipae*: Swezey, 1925c: 374.


Collections: none.
Island distribution: none.

107. **Paranaemia vittigera** (Mannerheim)

**Purposely introduced, not established.**

*Paranaemia vittigera* (Mannerheim, 1843: 312): BMASC (as a synonym of *Naemia vittigera* without author given)


*Ceratomegilla vittigera*: BMASC.

*Hippodamia vittigera*: BMASC.

*Naemia vittigera* (Mannerheim): Nishida, 2002: 51; BMASC.

Origin: California 1952 (as *Ceratomegilla vittigera* (Mannerheim)): Weber, 1953: 129; Lai et al., 1986: 19; DoA.


Collections: none.
Island distribution: none.

Discussion: Gordon (1985: 691) showed *Ceratomegilla vittigera*, *Hippodamia vittigera* and *Naemia vittigera* to be synonyms of *Paranaemia vittigera*.

108. **Pentilia castanea** Mulsant

**Purposely introduced, not established.**


*Pentilia castanea*: Fullaway, 1952: 104; BMASC.

Origin: Puerto Rico 1939 (as *Pentilia castanea* Mulsant): Lai et al., 1986: 57; DoA.

Intended target pest: scales (Diaspididae & Coccidae): Lai et al., 1986: 57; DoA.

Collections: none.
Island distribution: none.

109. **Pentilia egena** Mulsant

**Purposely introduced, not established.**


*Pentilia egena*: Swezey et al., 1939: 351; Fullaway, 1952: 104.

Origin: Brazil 1936 (as *Pentilia egena*): Swezey et al., 1939: 351.
Brazil 1936 (as Pentilia egena Mulsant): Lai et al., 1986: 57; DoA.
Intended target pest: diaspine coccid: Swezey et al., 1939: 351.
   scales (Coccidae & Diaspididae): Lai et al., 1986: 57; DoA.
Collections: none.
Island distribution: none.

110. Pentilia insidiosa Mulsant
Purposely introduced, not established.
Intended target pest: scales (Coccidae & Diaspididae): Lai et al., 1986: 58; DoA.
Collections: none.
Island distribution: none.
Discussion: Although Nishida (2002: 52) and the BMASC list the correct name and author, the date provided 1866, is in error.

111. Pharoscymnus sp.
Adventive introduction, established.
Intended target pest: none.
Collections: BM, UH.
Island distribution: Oahu, Molokai.
Discussion: The UH collection contains a single specimen with a note that 6 specimens had been sent to Ken Hagen for identification. There was an accompanying note that R. D. Gordon had identified the specimens as “Pharoscymnus sp. possibly undesc.” This is also corroborated in Beardsley’s (1980: 179) note. The BM collection contains one specimen from Molokai.

112. Phryncocaria gratiosa (Mulsant)
Purposely introduced, not established.
   Coelophora gratiosa (Mulsant): Nishida, 2002: 50; BMASC.
   Phryncocaria gratiosa: BMASC (as a synonym of C. gratiosa).
Origin: Australia 1897 (as Phryncocaria gratiosa (Mulsant)): Timberlake, 1943: 35.
Intended target pest: Lecanium depressum.
Collections: none.
Island distribution: none.
Discussion: Houston (1983: 19 & 1988: 199) show precedence for the use of Phryncocaria gratiosa (Mulsant) with Coelophora gratiosa (Mulsant) as a synonym.

113. Propylea quatuordecimpunctata subsp. japonica (Thunberg)
Purposely introduced, not established.
Propylea quatuordecimpunctata subsp. japonica (Thunberg, 1781: 12): correct spelling of species.
   Propylea quatuordecimpunctata: (misspelling) BMASC.
Origin: Japan, no date but presume 1895 (as Propylea 14-punctata japonica (Thunberg)): Timberlake, 1943: 28.
Intended target pest: none.
Collections: none.
Island distribution: none.

114. *Pseudoazya trinitatis* (Marshall)
**Purposely introduced, not established.**
*Azya trinitatus* Marshall: (misspelling) Lai et al., 1986: 9; DoA.


Intended target pest: scales (Diaspididae): Lai et al., 1986: 9; DoA.

Collections: none.
Island distribution: Oahu, Maui.

115. *Psyllobora vigintimaculata* (Say)
**Purposely introduced/Accidental introduction, established.**

*Psyllobora taedata* LeConte: Koebele, 1894: 102; Koebele, 1897b: 131; Koebele, 1898b: 265;
Swezey, 1925c: 374; Swezey, 1931c: 373; Nishida, 2002: 52; Leeper, 2014: 3.


*Psyllobora viginti taedata* Tavares et al., 2012: 1; Tavares et al., 2013: 3; Leeper, 2014: 4.

California 1896 (as *Psyllobora taedata* LeConte): Swezey, 1925c: 374; Swezey, 1931c: 373.

Collections: DoA, UH.
Island distribution: Oahu, Maui.

Discussion: It appears that the early purposeful introductions of *P. vigintimaculata* in 1894 and 1896 that failed. The DoA has specimens collected on Oahu in 2001 and 2002. In 2010 (Brenner, 2010: 22) and 2013 (Tavares, personal communications) collected samples on Maui and Oahu respectively. The lapse of so many years between documented release and these collections leads to speculation that the establishment was from an adventive introduction.

116. *Rhyzobius caecus* Blackburn
**Purposely introduced, not established.**
*Rhyzobius caecus* Blackburn, 1892a: 71: Correct spelling of genus.


Origin: Australia 1894 (as *Rhizobius caecus* (Blackburn)): Marsden, 1894: 32.
Intended target pest: Diaspidinae: Marsden, 1894: 32.
Collections: none.
Island distribution: none.

117. *Rhyzobius cyaneus* Blackburn
Purposely introduced, not established.

Origin: Australia 1894 (as *Rhyzobius cyaneus* (Blackburn)): Marsden, 1894: 32.
Intended target pest: *Diaspidinae* and *Chionaspis*: Marsden, 1894: 32.
Collections: none.
Island distribution: none.

118. *Rhyzobius fagus* (Broun)
Purposely introduced, not established.
*Rhyzobius fagus* (Broun, 1880: 648): This is the first time this name has been used in refereeing to a species introduced to Hawaii. See discussion below.

Origin: Australia 1894 (as *Rhyzobius satelles* (Blackburn)): Marsden, 1894: 32.
Collections: none.
Island distribution: none.

119. *Rhyzobius forestieri* (Mulsant)
Purposely introduced, established.

*Lindorus (Rhizobius) ventralis* Erichson: Illingworth, 1929: 249.
*Rhizobius ventralis* (Gr.): (misspelling, misnomer) Marsden, 1894: 32.
*Rhizobius ventralis* Erichson: (misnomer) Illingworth, 1923b: 279.
Rhyzobius lophanthae: Purposely introduced, established. Island distribution: non Collections: none. Intended target pest: Diaspidinae and Origin: Australia


120. Rhyzobius hirtellus Crotch

121. Rhyzobius lophanthae (Blaisdell)
**Rhizobius lophanthae** Blaisdell: Kotinsky, 1906e: 118.
*Rhizobius toowoobabat* Blackburn: (misspelling of genus and species) Koebele, 1894: 104.
*Rhizobius toowooba* Blackburn: (misspelling) Kotinsky, 1905b: 268.

California 1894 (as *Rhizobius lophanthae* (Boisduval)): Lai et al., 1986: 45; DoA.
California, ? (as *Lindorus lophanthae* Blaisdell): Swezey, 1923b: 300; Swezey, 1925c: 370; Swezey, 1931c: 369.
No Origin 1894 (as *Lindorus lophanthae* (Blaisdell): Funasaki et al., 1988: 117.

Collections: BM, DoA, UH.
Island distribution: Oahu, Molokai, Lanai, Maui, Hawaii.

**122. Rhizobius pulcher** Blackburn
Purposely introduced, not established.
*Rhizobius pulcher* Blackburn, 1892a: 71: Correct spelling of genus.
Origin: Australia 1894 (as *Rhizobius pulcher* (Blackburn)): Marsden, 1894: 32.
Intended target pest: Diaspidinae: Marsden, 1894: 32.
Collections: none.
Island distribution: none.

**123. Rhizobius speculifer** Blackburn
Purposely introduced, not established.
*Rhizobius speculifer* Blackburn, 1892b: 254: Correct spelling of genus.
Origin: Australia 1894 (as *Rhizobius speculifer* (Blackburn)): Marsden, 1894: 32.
Intended target pest: Diaspidinae and *Chionaspis*: Marsden, 1894: 32.
Collections: none.
Island distribution: none.

**124. Rodolia cardinalis** (Mulsant)
Purposely introduced, established.
*Novius cardinalis* Mulsant: Kotinsky, 1906e: 118; Kirkaldy, 1909a: 410; Fullaway, 1919a: 2; Swezey, 1923b: 300; Swezey, 1925c: 369; Swezey, 1925d: 364; Swezey, 1931c: 368; Leeper, 1976: 295; BMASC.
*Novius cardinalis* (Mulsant): Ehrhorn et al., 1913: 299.

Novius: Silvestri, 1910: 301.


Rodolia cardinalis: Swezey, 1943a: 286.

Rodolia (Macronovius) cardinalis (Mulsant): Leeper, 1976: 299.


Vedalia cardinalis: Kotinsky, 1905a: 157; Craw, 1905a 144; Craw, 1905b: 322; Swezey, 1906a: 18; Craw, 1907: 156; Ehrhorn, 1915b: 96; Fullaway, 1924b: 432; Pemberton, 1933: 231; Leeper, 1976: 299.

Vedalia cardinalis: (V lower case) Ehrhorn, 1911c: 165.

Vedalia (Novius) cardinalis Mulsant: Fullaway et al., 1922: 22.


Origin: Australia 1890 (as Rodolia cardinalis Mulsant): Lai et al., 1986: 64; DoA.

Australia 1890 (as Rodolia cardinalis (Mulsant)): Zimmerman, 1948c: 136-137; Pemberton, 1964a: 699.

Australia via California 1890 (as Novius cardinalis Mulsant): Swezey, 1923b: 300; Swezey, 1925c: 369.

Australia probably via California 1890 (as Novius cardinalis Mulsant): Swezey, 1931c: 368.

California 1890 (as Novius cardinalis): Perkins, 1943: 2.

Florida, no date (as Vedalia cardinalis): Pemberton, 1933: 231.

No Origin 1890 (as Rodolia cardinalis Mulsant): Funasaki et al., 1988: 119.

No Origin 1906 (as Vedalia cardinalis): Craw, 1907: 156.


Cottony cushion scale: Swezey, 1925c: 369.

Icerya purchasi Maskell: Lai et al., 1986: 64; DoA.

Collections: BM, DoA, UH.

Island distribution: Niihau, Kauai, Oahu, Molokai, Lanai, Maui, Hawaii.

125. Rodolia fumida Mulsant
Purposely introduced, not established.

Rodolia fumida Mulsant 1850: 904: Koebele 1897a: 73; Koebele 1897b: 114; Koebele 1898a: 214; Swezey 1925c: 373; Swezey 1931c: 372; Lai et al. 1986: 64; Nishida 2002: 52; BMASC; DoA.

Origin: China 1895 1906 (as Rodolia fumida Mulsant): Swezey 1931c: 372; Lai et al. 1986: 64; DoA.

Intended target pest: Icerya purchasi Maskell: Swezey 1925c: 373; Lai et al. 1986: 64; DoA.

Collections: none.

Island distribution: none.

126. Rodolia koebelei (Coquillett)
Purposely introduced, not established.

Rodolia koebelei (Coquillett 1893: 20): This is the first time this name has been used in refereeing to a species introduced to Hawaii. See discussion below.

Novius koebelei (Blackburn): Nishida, 2002: 52; BMASC; DoA.

Novius koebelei Horn: DoA.
Novius koebelei: Koebele, 1897a: 97; Koebele, 1897b: 119; Koebele, 1898a: 217; Swezey, 1923b: 300; Perkins, 1925: 361; Swezey, 1931c: 369; Perkins, 1943: 3; Swezey, 1925c: 369; Lai et al., 1986: 49.

Novius koebelei: (misspelling) Marsden, 1894: 32.

Platyomus koebelei Blackburn: Swezey, 1925c: 374; Swezey, 1931c: 373; Lai et al., 1986: 60; DoA.

Platyomus koebelei: Kotinsky, 1905a: 154; BMASC.

Scymnodes koebelei: BMASC.


Australia 1904 (as Platyomus koebelei Blackburn): Swezey, 1925c: 374; Swezey, 1931c: 373; Lai et al., 1986: 60; DoA.

Australia 1904 (as Novius koebelei Horn): DoA.

Australia via California, ? (as Novius koebelei): Swezey, 1923b: 300; Swezey, 1925c: 369.


Intended target pest: soft scales (Coccidae): Lai et al., 1986: 60; DoA.

cottony cushion scale: Swezey, 1923b: 300; Swezey, 1925c: 369.

Coccidae: Swezey, 1925c: 374.

Icerya purchasi Maskell: DoA.

Collections: none.

Island distribution: none.

Discussion: Gordon (1972: 26) pointed out that Coquillett (1893:20) was the first to describe koebelei by describing the egg, four larval instars and pupa without a description of the adult stage as Novius koebelei. Swezey (1923b: 300; 1925c: 369) stated the species was “Abundant in 1897, but later disappeared.”

127. Rodolia pumila Weise

Purposely introduced, not established.

Rodolia pumila Weise, 1892: 26: Koebele, 1897a: 73; Koebele, 1897b: 114; Koebele, 1898a: 214; Swezey, 1925c: 373; Swezey, 1931c, 372; Lai et al., 1986: 64; Nishida, 2002: 52; DoA.

Origin: China 1895 (as Rodolia pumila Weise): Swezey, 1925c: 373; Swezey, 1931c, 372; Lai et al., 1986: 64; DoA.

Intended target pest: Icerya purchasi Maskell: Swezey, 1925c: 373; Lai et al., 1986: 64; DoA.

Collections: none.

Island distribution: none.

128. Sasajiscymnus anomalus (Chapin)

Purposely introduced, established.


Guam 1971 (as Pseudoscymnus anomalus Chapin): Davis, 1972: 188.


Intended target pest: Aspidiotus destructor Signoret: Lai et al., 1986: 62; DoA.

Collections: BM, UH.
Island distribution: Oahu.

129. Scymnobius bilucernarius (Mulsant)
Purposely introduced, established.
Scymnobius bilucernarius (Mulsant, 1850: 997): This is the first time this name has been used in refereeing to a species introduced to Hawaii. See discussion below.
Nephus pictus (Gorham): Swezey, 1934a: 389; Krauss, 1944b: 86; Nishida, 2002: 52; BMASC.
Nephus (Scymnus pictus): Fullaway, 1925: 34.
Scymnus bilucernarius: Browne, 1939: 177; Leeper, 1976: 296; BMASC.
(Scymnus) pictus Gorham: Chapman, 1938: 321.
Scymnus pictus: Fullaway, 1926: 48; Fullaway, 1927: 47; Fullaway, 1952: 104; BMASC.
Origin: Panama 1924; Mexico 1930.
No Origin 1930 (as Nephus bilucernarius Mulsant): Funasaki et al., 1988: 117.
Panama 1933 (as Nephus pictus Gorham): Chapman, 1938: 322.
Intended target pest: pineapple mealybug: Swezey, 1933: 218; Chock, 1933: 237.
Dysmicoccus brevipes (Cockerell): Lai et al., 1986: 49 and 66; DoA.
Collections: BM, UH.
Island distribution: Niihau, Kauai, Oahu, Molokai, Lanai, Maui, Hawaii.
Discussion: Gordon & Gonzalez (2002: 59) raised Scymnobius to the status of a valid genus. They (Gordon & Gonzalez 2002: 63) then made Scymnobius bilucernarius (Mulsant) a new combination with synonyms Scymnus bilucernarius Mulsant and Scymnus pictus Gorham.

130. Scymnobius galapagoensis (Waterhouse)
Adventive introduction, established.

[55]
Scymnobius galapagoensis (Waterhouse, 1845: 41): This is the first time this name has been used in refereeing to a species introduced to Hawaii. See discussion below.

Scymnus ocellatus Sharp: (misspelling) Swezey & Bryan, 1929: 298.

Origin: Scymnobius galapagoensis (Waterhouse) (=Scymnus ocellatus Sharp) was described by Sharp (Blackburn & Sharp, 1885: 147) from specimens collected in the islands. See Discussion.

Intended target pest: none.
Collections: BM, UH.
Island distribution: Kauai, Oahu, Molokai, Lanai, Maui, Hawaii.

Discussion: Gordon & Gonzalez (2002: 67) synonymize Scymnus ocellatus with Scymnobius galapagoensis. The UH collection has two specimens labeled as S. ocellatus collected on Oahu in 1907 and 1927 and three specimens collected on Maui in 1904 and 1905.

131. Scymnus guttulatus (LeConte)
Purposely introduced, not established.

Scymnus guttulatus (LeConte, 1852: 136): This is the first time this name has been used in refereeing to a species introduced to Hawaii. See discussion below.

Scymnus guttulatus LeConte: (misspelling) Koebele, 1894: 103.
Scymnus guttulatus LeConte: Koebele, 1907: 159; Nishida, 2002: 52; BMASC.

Origin: California 1894 (as Scymnus guttatus LeConte): Koebele, 1894: 103.
No Origin 1893 (as Scymnus guttulatus LeConte): Koebele, 1907: 159.

Intended target pest: Lecanium and Dacty lopius: Koebele, 1894: 103.
Collections: none
Island distribution: none
Discussion: Gordon (1976: 298) declared a new combination Nephus (Scymnobius) guttulatus (LeConte) with Scymnus guttulatus LeConte a synonym. Then, Gordon & Gonzalez (2002: 59) raised Scymnobia to the status of a valid genus.

132. Scymnus (Pullus) dorcatomoides Weise
Purposely introduced, established.

Scymnus dorcatomoides Weise: Leeper, 1976: 301; Nishida, 2002: 52; BMASC.

Origin: Data not available, probably by Koebele: Swezey, 1925a: 26.
Intended target pest: none.
Collections: UH, DoA.
Island distribution: Oahu.
Discussion: The UH collection contains one specimen from Hong Kong collected in 1925, two specimens from Oahu collected in 1926 and 1 specimen from Oahu collected in 1956 with note "E. B. Britton det. 1960 as det. at BM, confirmed by Bielanski."

133. Scymnus (Pullus) horni Gorham
Accidently introduced, established.
Scymnus (Pullus) horni Gorham, 1897: 229; Kumashiro, 1991: 2; Kumashiro, 1993: 2; Samuelson et al., 2007: 42.

Scymnus horni Gorham: Kumashiro et al., 2001: 158; Nishida, 2002: 52; Krushelnycky et al., 2014: 44; BMASC.


Collections: UH, DoA.

Island distribution: Oahu, Maui, Hawaii.

134. Scymnus (Pullus) latemaculatus Motschulsky

Adventive introduction, established.

Scymnus (Pullus) latemaculatus Motschulsky, 1858: 121: This is the first time this name has been used in refereeing to a species introduced to Hawaii. See discussion below.

Scymnus taiwanus (Ohta): Hue et al., 2007: 2.

Origin: none.

Intended target pest: none.

Collections: DoA.

Island distribution: Oahu, Hawaii.

Discussion: Poorani (2002: 61) shows *Scymnus taiwanus* (Ohta) to be a synonym of *Scymnus (Pullus) latemaculatus* Motschulsky.

135. Scymnus (Pullus) loewii Mulsant

Purposely introduced, established.


Pullus kinbergi: (misidentification) BMASC.


Pullus loewii: BMASC.

Scymnus kinbergi Boheman: (misidentification) Muir, 1924: 353; Leeper, 1976: 302

Scymnus kinbergi: (misidentification) BMASC.


Scymnus loewii Mulsant: Swezey, 1925a: 26; Leeper, 1976: 301; Nishida, 2002: 52; BMASC.


Origin: Data not available. Scymnus vividus (= Scymnus (Pullus) loewii Mulsant) was described by Sharp (Blackburn & Sharp, 1885: 146) from specimens collected in the islands.

Intended target pest: none.

Collections: BM, UH.

Island distribution: Kauai, Oahu, Molokai, Lanai, Maui, Hawaii.

### 136. Scymnus (Pullus) pallens LeConte

Purposely introduced, not established.

Scymnus (Pullus) pallens LeConte, 1852: 137: This is the first time this name has been used in refereeing to a species introduced to Hawaii. See discussion below.

*Scymnus pallens* LeConte: Koebele, 1894: 103; Nishida, 2002: 52; BMASC.

Origin: California 1894 (as Scymnus pallens LeConte): Koebele, 1894: 103.


Collections: none.

Island distribution: Molokai.

Discussion: Gordon (1976: 5) placed this species in the subgenus Pullus.

### 137. Scymnus (Pullus) sp.

Purposely introduced, not established.

*Scymnus (Pullus)* sp.

*Pullus* sp.: Lai et al., 1986: 63; DoA.

Origin: Philippines 1930 (as Pullus sp.): Lai et al., 1986: 63; DoA.

Intended target pest: Saccharicoccus sacchari (Cockerell): Lai et al., 1986: 63; DoA.

Collections: none.

Island distribution: none.

### 138. Scymnus (Pullus) subvillosus (Goeze)

Purposely introduced, not established.


*Scymnus subvillosus* (Goeze): Lai et al., 1986: 67; Nishida, 2002: 52; DoA.

Origin: Madeira 1962 (as Scymnus subvillosus (Goeze)): Davis & Krauss, 1963: 248; Lai et al., 1986: 67; DoA.

Intended target pest: mealybugs, aphids: Lai et al., 1986: 67; DoA.


Collections: none.

Island distribution: none.

### 139. Scymnus (Pullus) suturalis Thunberg

Purposely introduced, not established.


Collections: DoA.
Island distribution: Maui, Hawaii.
Discussion: The DoA has two specimens in their collection both collected on Maui in 1994 and identified by Gordon.

140. *Scymnus (Pullus) uncinatus* Sicard

_Purposely introduced, established._


_Diomus uncinatus* (Sicard): 
Pullus uncinatus* Sicard: Leeper, 1976, 302.
*Pullus uncinatus*: Fullaway, 1925: 34; Fullaway, 1926: 48; Fullaway, 1927: 47; Swezey, 1931c: 374; Chapman, 1938: 321; Swezey, 1940: 362; Leeper, 1976: 302; BMASC.
*Scymnus uncinatus*: Leeper, 1976, 302.

Origin: Mexico 1922; Panama 1924 (as *Scymnus uncinatus* Sicard): Lai et al., 1986: 67; Pandey, 2002: 26; DoA.

Mexico 1922 (as *Scymnus (Pullus) uncinctus* Sicard): (misspelling) Swezey, 1945: 225-226;
Panama 1924 (as *Pullus uncinatus*): Swezey, 1931c: 374; Chapman, 1938: 321.
Panama 1924 (as *Scymnus (Pullus) uncinatus*): Gonzalez-Hernandez, 1995: 11.
No Origin 1922 (as *Scymnus uncinatus* Sicard): Funasaki et al., 1988: 119.

*Dysmicoccus brevipes* (Cockerell): Lai et al., 1986: 67; DoA.

Collections: BM, UH.
Island distribution: Oahu, Molokai, Hawaii.
Discussion: The BM has three specimens identified as *Diomus uncinatus* collected on Oahu in 1940-1941 with additional specimens collected later. The BM also contains specimens identified as *Scymnus (Pullus) uncinatus*. One of these specimens was collected in 1995, determined by Beardsley and Perreira.

141. *Scymnus ambulans* Blackburn

_Purposely introduced, established._


*Scymnodes koebeli* (Blackburn): Marsden, 1894: 32.
*Scymnodes koebeli var. varipes* Blackburn: Leeper, 1976: 301.

Origin: Australia 1894 (as *Scymnodes koebeli* (Blackburn)): Marsden, 1894: 32.

Intended target pest: none.
Collections: UH.
142. *Scymnus apiciflavus* (Motschulsky)

**Purposely introduced, not established.**

*Scymnus apiciflavus* (Motschulsky, 1858: 119): Correction with author in parenthesis.


**Origin:** Malaysia 1931 (as *Scymnus apiciflavus* Motschulsky): Lai *et al.*, 1986: 66; DoA.


**Intended target pest:** *Trionymus sacchari*: Swezey *et al.*, 1939: 350.

*Saccharicoccus sacchari* (Cockerell): Lai *et al.*, 1986: 66; DoA.


**Collections:** none.

Island distribution: Oahu, Hawaii.

Discussion: Slipinski *et al.* (2012: 682) show the synonymies listed above.

143. *Scymnus binotulatus* Boheman

**Purposely introduced, not established.**

*Scymnus binotulatus* Boheman, 1859: 208: Nishida, 2002: 52; BMASC.

- *Scymnus binotulatus*: Lai *et al.*, 1986: 66; DoA.

**Origin:** Philippines 1930 (as *Scymnus binotulatus* (?)): Swezey *et al.*, 1939: 350.

- Philippines 1930 (as *Scymnus binotulatus*): Lai *et al.*, 1986: 66; DoA.

**Intended target pest:** *Trionymus sacchari*: Swezey *et al.*, 1939: 350.

- sugarcane mealybug: Lai *et al.*, 1986: 66; DoA.

**Collections:** none.

Island distribution: none.

Discussion: Poorani (2002: 64) placed the author’s name in parentheses.

144. *Scymnus blackburni* Slipinski, Pang & Booth

**Purposely introduced, not established.**

*Scymnus blackburni* Slipinski, Pang & Booth, 2012: 684: This is the first time this name has been used in refereeing to a species introduced to Hawaii. See discussion below.


**Origin:** Australia 1894 (as *Midus pygmaeus* Blackburn): Marsden, 1894: 32.

California 1930 (as *Midus pygmaeus* Blackburn): Lai *et al.*, 1986: 48; DoA.

California 1930 (as *Midus pygmaeus*): Swezey *et al.*, 1939: 350.

**Intended target pest:** mealybugs: Lai *et al.*, 1986: 48; DoA.

- Dactylopidae: Marsden, 1894: 32.

**Collections:** none.

Island distribution: none.
Discussion: Slipinski et al. (2012: 684) declared the new combination with Midus pygmaeus a synonym.

145. Scymnus levaillanti Mulsant
Purposely introduced, not established.
Scymnus levaillanti Mulsant, 1850: 964: Nishida, 2002: 52; BMASC.
Scymnus (s. str.) levaillanti Mulsant: Davis & Krauss, 1963: 248.
Scymnus lavaillanti Mulsant: (misspelling) Lai et al., 1986: 66; DoA.
Origin: Madeira 1962 (as Scymnus lavaillanti Mulsant): (misspelling) Lai et al., 1986: 66; DoA.
Madeira 1962 (as Scymnus (s. str.) levaillanti Mulsant): Davis & Krauss, 1963: 248.
Intended target pest: mealybugs, aphids: Lai et al., 1986: 66; DoA.
Collections: none.
Island distribution: Oahu.

146. Scymnus margipallens (Mulsant)
Purposely introduced, not established.
Scymnus margipallens (Mulsant, 1850: 953): This is the first time this name has been used in refereeing to a species introduced to Hawaii. See discussion below.
Diomus margipallens (Mulsant): Swezey, 1933: 218; Swezey et al., 1939: 350; Lai et al., 1986: 31; Nishida, 2002: 50; DoA.
Origin: Panama 1924 (as Diomus margipallens (Mulsant)): DoA.
Mexico 1930 (as Diomus margipallens (Mulsant)): Swezey, 1933: 218; Swezey et al., 1939: 350.
Dysmicoccus brevipes (Cockerell): Lai et al., 1986: 31; DoA.
Collections: none.
Island distribution: none.
Discussion: The Integrated Taxonomic Information System (version Apr 2011) lists Scymnus margipallens (Mulsant 1850) as the preferred name and Diomus margipallens (Mulsant 1850) as a synonym. Mulsant (1850: 935) names and describes the species as Scymnus margipallens making it confusing as to why his name is in parenthesis.

147. Scymnus nebulosus LeConte
Purposely introduced, not established.
Scymnus nebulosus LeConte, 1852: 137: Koebele, 1894: 103; Nishida, 2002: 52; BMASC.
Collections: none.
Island distribution: none.

148. Scymnus sp.
Purposely introduced, not established.
Scymnus sp.: Swezey, 1931c: 374; Chapman, 1938: 321; Lai et al., 1986: 67; DoA.
Origin: Hong Kong 1925 (as *Scymnus* sp.): Swezey, 1931c: 374; Chapman, 1938: 321; Lai *et al.*, 1986: 67; DoA.


*Nipaecoccus vastator* (Maskell): Lai *et al.*, 1986: 67; DoA.

Collections: none.
Island distribution: none.

149. *Scymnus* sp.

*Purposely introduced, not established.*

*Scymnus* sp.: Lai *et al.*, 1986: 67; DoA.

Origin: California 1948 (as *Scymnus* sp.): Lai *et al.*, 1986: 67; DoA.

Africa via California 1948 (as *Scymnus* sp.): Zimmerman, 1949: 341.


Collections: none.
Island distribution: none.

150. *Scymnus* sp.

*Purposely introduced, not established.*

*Scymnus* sp.: Swezey, 1925: 373; Swezey, 1931c: 372.

Origin: California 1893 (as *Scymnus* sp.): Swezey, 1925c: 373; Swezey, 1931c: 372.

Intended target pest: mealybugs: Swezey, 1925c: 373.

Collections: none.
Island distribution: none.

151. *Scymnus* sp.

*Purposely introduced, not established.*

*Scymnus* sp.: Lai *et al.*, 1986: 67; DoA.

Origin: California 1893; Philippines 1958 (as *Scymnus* sp.): Lai *et al.*, 1986: 67; DoA.

California 1893 (as *Scymnus* sp.): Chapman, 1938: 320; Gonzalez-Hernandez, 1995: 11.

Intended target pest: mealybugs: Lai *et al.*, 1986: 67; DoA.


Collections: none.
Island distribution: none.

Discussion: It is uncertain if the unidentified *Scymnus* species listed here by the DoA as coming from California in 1893 is the same as the one above listed by Swezey (1925: 373).

152. *Scymnus* sp.

*Purposely introduced, not established.*

*Scymnus* sp.: Davis, 1958, 64; Lai *et al.*, 1986: 67; DoA.

Origin: India 1958 (as *Scymnus* sp.): Davis, 1958, 64; Lai *et al.*, 1986: 67; DoA.

Intended target pest: mealybugs: Davis, 1958, 64; Lai *et al.*, 1986: 67; DoA.

Collections: none.
Island distribution: none.

153. *Scymnus* sp.

*Purposely introduced, not established.*

*Scymnus* sp.: Davis, 1959: 64; Lai *et al.*, 1986: 67; DoA.

Origin: Philippines 1958 (as *Scymnus* sp.): Davis, 1959: 64; Lai *et al.*, 1986: 67; DoA.
Intended target pest: *Aphis gossypii* Glover: Davis, 1959: 64; Lai *et al.*, 1986: 67; DoA. 
Collections: none.
Island distribution: none.

154. *Scymnus quadrivittatus* Mulsant
Purposely introduced, not established.

*Scymnus quadrivittatus* Mulsant, 1850: 358; Lai *et al.*, 1986: 66; Nishida, 2002: 52; DoA.


Origin: California 1948 (as *Scymnus quadrivittatus* Mulsant): Lai *et al.*, 1986: 66; DoA.

Intended target pest: *Dysmicoccus brevipes* (Cockerell): Lai *et al.*, 1986: 66; DoA.

Collections: none.
Island distribution: none.

155. *Serangium maculigerum* Blackburn
Purposely introduced, established.


*Cryptognatha maculigerum*: BMASC.

*Cyrema nigellum*: (misidentification/misspelling of Cheame) Fullaway, 1919b: 5.

*Cyremma nigellum* Blackburn: (misidentification) Koebele, 1897a: 77; Koebele, 1897b: 119; Koebele, 1898a: 218.


Origin: Australia 1894 (as *Cyrena nigellum*): (misidentification) Fullaway, 1920: 243.

Australia 1894 (as *Serangium maculigerum* Blackburn): Giffard, 1908a: 173; Swezey, 1923b: 300; Swezey, 1925c: 370; Swezey, 1931c, 369; Lai *et al.*, 1986: 68; DoA.

Australia, no date (as *Serangium maculigerum* Blackburn): Swezey, 1925d: 364.

No Origin 1894 (as *Serangium maculigerum* Blackburn): Funasaki *et al.*, 1988: 120.

Intended target pest: armored scales: Lai *et al.*, 1986: 68; DoA.

Diaspine scales: Swezey, 1923b: 300; Swezey, 1925c: 370; Swezey, 1925d: 364.

Collections: BM, UH.
Island distribution: Oahu, Maui.

156. *Stethorus gilvifrons* (Mulsant)
Adventive introduction, not established.


Origin: none.

Intended target pest: none.
Collections: none.
Island distribution: none.

157. *Stethorus nigripes* Kapur
Purposely introduced, not established.
*Stethorus nigripes* Kapur, 1948: 316; Nishida, 2002: 53; BMASC.

*Stethorus loxtoni* (Britton & Lee):
*Stethorus loxtoni Britton* Nishida et al., 1981: 429; Lai et al., 1986: 69; DoA.
*Stethorus loxtoni*: BMASC.
*Stethorus nigripes*: Anonymous, 2006: 3; DoA
*Tetranychus* spp.: Lai et al., 1986: 69; DoA.
Collections: none.
Island distribution: Oahu.

158. *Stethorus punctum picipes* Casey
Purposely introduced, not established.
*Stethorus punctum picipes* Casey, 1899: 136; Nishida, 2002: 53; BMASC.

*Scymnus punctum*: Compere, 1899: 261.
*Stethorus picipes* (Casey):
*Stethorus picipes*: Fullaway, 1952: 104; Anonymous, 2006: 3; BMASC; DoA.
*Stethorus punctum*: BMASC.
California 1952 and 1978 (as *Stethorus picipes* Casey): Lai et al., 1986: 69; DoA.
*Tetranychus* spp.: Lai et al., 1986: 69; DoA.
Collections: none.
Island distribution: Oahu.

159. *Stethorus siphonulus* Kapur
Purposely introduced, established.

*Scymnus vagans*: Silvestri, 1910: 326.
*Stethorus vagans*: (misidentified) Swezey, 1922: 38; Swezey, 1923c: 6; Swezey, 1926: 360; Garnett & Haramoto, 1967: 405; Raros, 1971:2; Leeper, 1976: 303; BMASC.
*Scymnus (Stethorus) vagans*: Raros, 1971: 1
Origin: China 1896 (as *Stethorus siphonulus* Kapur): Lai et al., 1986: 70; DoA.
Australia, no date (as *Scymnus vagans*): Silvestri, 1910: 326.
No Origin 1895 (as Stethorus siphonulus Kapur): Funasaki et al., 1988: 120.
Intended target pest: predacious on leaf-mites: Swezey, 1923b: 301.
Tetranychus spp.: DoA.

Collections: UH.
Island distribution: Kauai, Oahu, Maui, Hawaii.
Discussion: E. B. Britton of the C.S.I.R.O. made final determination of the species as Stethorus siphonulus (Raros & Haramoto, 1974: 457). The unpublished thesis by Raros (Raros 1971) Biology and field abundance of Stethorus vagans (Blackburn) (Coleoptera: Coccinellidae), a predator of spider mites, in Hawaii was not cited above but was a significant contribution to understanding Stethorus siphonulus in Hawaii.

160. Sticholotis quadrimaculata (Blackburn)
Purposely introduced, not established.
Sticholotis quadrimaculata (Blackburn, 1892b: 242): This is the first time this name has been used in refereeing to a species introduced to Hawaii. See discussion below.
Gymuscymis quatromaculatus (Blackburn): (misspelling of both genus and species) Marsden, 1894: 32.
Origin: Australia 1894 (as Gymuscymis quatromaculatus (Blackburn)): Marsden, 1894: 32.
Intended target pest: Lecanidai, etc., Marsden, 1894: 32.
Collections: none.
Island distribution: none.
Discussion: Slipinski (2004: 391) showed Gymnoscymnus quadrimaculatus Blackburn to be a synonym of Sticholotis quadrimaculata (Blackburn).

161. Sticholotis ruficeps Weise
Purposely introduced, established.
Sticholotis punctata: Silvestri, 1910: 307; BMASC.
Sticholotis punctatus Crotch: Koebele, 1897a: 79; Koebele, 1897b: 121; Koebele, 1898b: 258; Swezey, 1923b: 300; Swezey, 1925c: 370; Swezey, 1925d: 364; Swezey, 1931c: 369; Ito & Carter, 1932: 44; Sakimura et al., 1940: 452; Swezey, 1943b: 5; Zimmerman, 1948c: 283; Leeper, 1976: 304.
China, Japan 1895 (as Sticholotis punctatus Crotch): Swezey, 1923b: 300; Swezey, 1925c: 370; Swezey, 1931c: 369.
China, Japan 1895 (as Sticholotis ruficeps Weise): Lai et al., 1986: 70; DoA.
China, no date (as Sticholotis punctatus Crotch): Swezey, 1925d: 364
No Origin 1895 (as Sticholotis ruficeps Weise): Funasaki et al., 1988: 120.
Intended target pest: armored scales: Lai et al., 1986: 70; DoA.
Diaspine scales: Swezey, 1923b: 300; Swezey, 1925c: 370; Swezey, 1925d: 364.

Collections: BM, UH.
Island distribution: Oahu, Molokai, Lanai, Maui, Hawaii.

162. *Synonycha grandis* (Thunberg)

*Purposely introduced, not established.*


*Synonycha grandis* (Thunberg): (misspelling) Swezey, 1925c: 373; Nishida, 2002: 53; BMASC; DoA.

*Synonycha grandis* Thunberg: (misspelling) Koebele, 1897a: 78; Koebele, 1897b: 120; Koebele, 1898a: 218; Swezey, 1923b: 301; Swezey, 1925c: 371; Swezey, 1931c: 370; Davis, 1959: 64; Lai et al., 1986: 70; DoA.

*Synonycha grandis*: (misspelling) Perkins, 1925: 361; Perkins, 1943: 3.


*Aphis gossypii* Glover: Davis, 1959: 64.

aphids: Lai et al., 1986: 70; DoA.

Collections: none.
Island distribution: Oahu.
Discussion: Poorani (2002: 36) provided the correct spelling *Synonycha grandis*.

163. *Telsimia nigra* (Weise)

*Purposely introduced, not established.*

*Telsimia nigra* (Weise, 1879: 149): This is the first time this name has been used in refereeing to a species introduced to Hawaii. See discussion below.


*Pentilia nigra* Weise?: Giffard, 1908a: 173.


*Platynaspis nigra* (Weise, 1879: 149): Nishida, 2002: 52; BMASC.

*Platynaspis nigra* Weise: Koebele, 1897a: 78; Koebele, 1897b: 121; Koebele, 1898b: 258.

*Platynaspis (Pentilia) nigra* Weise: Kirkaldy, 1909a: 412; Silvestri, 1910: 308.

*Origin:* China, Japan 1895 (as *Pentilia nigra*): Fullaway, 1920: 243; BMASC.

China, Japan 1895 (as *Pentilia nigra* Weise): Swezey, 1923b: 300; Swezey, 1925c: 370; Swezey, 1931c: 369; Lai et al., 1986: 58.

China and Japan 1895 (as *Pentilia nigra* Weise?): Giffard, 1908a: 173.

China 1896 (as *Platynaspis (Pentilia) nigra* Weise): Kirkaldy, 1909a: 412.


Collections: DoA.
Island distribution: Oahu.
Discussion: Both Swezey publications (1923: 300 and 1925: 370) noted that when introduced, Koebele used the name *Pentilia nigra* in error and, that although established, the correct name had yet to be determined. The species does not appear to have maintained establishment. The DoA has two
specimens that appear to be old (1905-1931) but without date. Chapin (1926: 129) synonymized the genus *Platynaspis* Weise with the genus *Telsimia* Casey.

164. *Telsimia nitida* Chapin

*Purposely introduced, established.*


*Cryptogonus nigripennis*: (misidentification) Swezey, 1941: 11; Fullaway, 1952: 104; BMASC.


Origin: China and Japan 1895; Guam 1936 (as *Telsimia nitida* Chapin): DoA.


Guam, no date (as *Telsimia nitida* Chapin): (misidentification) Swezey, 1941: 11.

No Origin 1895 (as *Telsimia nitida* Chapin): Funasaki et al., 1988: 121.


*Lepidosaphes beckii* (Newman), *Pinnaspis buxi* (Bouche): DoA.

Collections: BM, UH.

Island distribution: Kauai, Oahu, Molokai, Lanai, Hawaii.

165. *Tenuisvalvae bromelicola* (Sicard)

*Purposely introduced, not established.*

*Tenuisvalvae bromelicola* (Sicard, 1925: 512): This is the first time this name has been used in refereeing to a species introduced to Hawaii. See discussion below.


*Cleothera bromelicola*: Fullaway, 1925: 34; Fullaway, 1926: 48.


*Dysmicoccus brevipes* (Cockerell): Lai et al., 1986: 23; DoA.

Collections: none.

Island distribution: none.

Discussion: Gordon & Canepari C. (2008: 411) declared *Tenuisvalvae bromelicola* (Sicard) a new combination with *Cleothera bromelicola* Sicard a synonym.

166. *Thalassa montezumae* Mulsant

*Purposely introduced, not established.*

*Thalassa montezumae* Mulsant, 1850: 512: Koebele, 1907: 160; Swezey, 1925c: 374; Swezey, 1931c: 373; Nishida, 2002: 53; BMASC.


Arizona 1906 (as *Thalassa montezumae* Mulsant): Swezey, 1925c: 374; Swezey, 1931c: 373.


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Collections: BM, UH.
Island distribution: Kauai, Oahu, Molokai, Lanai, Hawaii.

167. *Vibidia duodecimguttata* (Poda)
Purposely introduced, not established.


Origin: Japan 1895 (as *Vibidia duodecim-guttata* (Poda)): Timberlake, 1943: 41.

Intended target pest: mildew.

Collections: none.
Island distribution: none.

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