

AN ANNOTATED CHECKLIST OF THE COCCINELLID (COLEOPTERA COCCINELLIDAE) INTRODUCTIONS AND ESTABLISHMENTS IN HAWAII: 1885 to 2015

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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species as having been introduced to the Hawaiian Islands with forty-six (46) species considered established based on unpublished Hawaii State Department of Agriculture records and literature published in Hawaii.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* (= *Scymnobioides 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

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 (Linnaeus, 1758: 364): Swezey, 1925c: 374; Swezey, 1931c: 373; Weber, 1953: 129; Davis & Krauss, 1963: 248; Lai & Funasaki, 1986: 1; Nishida, 2002: 49; BMASC; DoA.

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

Adalia bipunctata: Fullaway, 1952: 104; Davis & Chong, 1968: 28.

Adalia frigida: BMASC.

Adalia humeralis: BMASC.

Adalia humeralis Say: Koebele, 1894: 102.

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

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

Origin: California 1894 (as *Adalia humeralis* Say): Koebele, 1894: 102.

California 1896 1905 1910 1952 (as *Adalia bipunctata* (Linnaeus)): Weber, 1953: 129.

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.

Germany 1909, California 1952, Madeira 1962 (as *Adalia bipunctata* (Linnaeus)): Lai & Funasaki, 1986: 1.

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

Intended target pest: aphids: Weber, 1953: 129; Lai & Funasaki, 1986: 1 and 23; DoA.
Aphids and Coccids: 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.

Aiolocaria mirabilis (Motschulsky): Timberlake, 1943: 39.

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.

Intended target pest: scale insects: Swezey, 1925c: 374.

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.

Platyomus lividigaster Mulsant: Koebele, 1897a: 76; Koebele, 1897b: 117; Koebele, 1898a: 217; Compere, 1899: 261; Kotinsky, 1906c: 417; Kotinsky, 1906e: 118; Ehrhorn *et al.*, 1913: 299; Swezey, 1923b: 301; Swezey, 1925c: 370; Illingworth, 1927: 393; Illingworth, 1929: 249; Swezey, 1925b: 301; Swezey, 1925c: 370; Swezey, 1925d: 364; Swezey & Bryan, 1929: 298; Swezey, 1935b: 97; Holdaway & Look, 1942: 258; Swezey, 1943b: 5; Krauss, 1944a: 11; Krauss, 1944b: 86; Fullaway & Krauss, 1945: 76; Fullaway, 1947: 52; Zimmerman, 1948c: 75, 77, 87 100; Peterson, 1957: 199; Pemberton, 1964a: 704; Leeper, 1976: 300; Suehiro, 1986: 50.

Platyomus lividigasta: (misspelling) Ehrhorn, 1910a: 21.

Platyomus lividigaster (Mulsant): Marsden, 1894: 32; Williams, 1931: 183.

Platyomus lividigaster: Koebele, 1896: 598; Van Dine, 1904: 23; Kotinsky, 1905a: 154 & 157; Swezey, 1906a: 18; Kirkaldy, 1907a: 101; Fullaway, 1909: 25; Kirkaldy, 1909a: 413; Kirkaldy, 1909b: 55; Silvestri, 1910: 313; Swezey, 1910: 114; Ehrhorn, 1910d: 178; Ehrhorn, 1911a: 115;

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.

Scymnodes lividigaster Mulsant: Leeper, 1976, 300.

Scymnodes lividigaster (Mulsant): Timberlake, 1927: 532; Swezey, 1954: 108; Ford, 1961: 318; Leeper & Beardsley, 1973: 8a; Leeper, 1976: 300; Leeper & Beardsley, 1976: 314; Stein & Onaga, 1983: 180; Lai & Funasaki, 1986: 66; Funasaki *et al.*, 1988: 119; Nishida, 2002: 52; BMASC; DoA.

Scymodes lividigaster (Mulsant): (misspelling) Leeper, 1975: 62.

Origin: Australia 1894 and 1896 (as *Scymnodes lividigaster* (Mulsant)): Lai & Funasaki, 1986: 66; DoA.

Australia 1894 (as *Platyomus lividigaster* Mulsant): Swezey, 1923b: 301; Swezey, 1925c: 370; Illingworth, 1929: 249; Swezey, 1931c: 370; Williams, 1931: 183; Krauss, 1945: 76; Pemberton, 1964a: 704.

Australia, no date (as *Platyomus lividigaster* Mulsant): Swezey, 1925d: 364.

No Origin 1894 (as *Scymnodes lividigaster* (Mulsant)): Funasaki, Lai, Nakahara, Beardsley & Ota, 1988: 119.

Intended target pest: plant lice: Swezey, 1923b: 301; Swezey, 1925c: 370; Swezey, 1925d: 364-365.

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

Collections: BM, UH.

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

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)

Purposely 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.

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

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 Dimmock: Nishida, 2002: 51.

Exochomus cubensis: BMASC.

Origin: none.

Intended target pest: scales.

Collections: none.

Island distribution: none.

Discussion: Chapin (1965b: 247) placed *Exochomus cubensis* Dimmock in the genus *Arawana* based on strong genitalic similarities. Gordon (1994: 133) concurred with Chapin's placement.

7. *Archegleis edwardsi* (Mulsant)

Purposely introduced, not established.

Archegleis 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.

Halzia pascoei (Gootch): (Misidentified, misspelling) Marsden, 1894: 31.

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 *Archegleis 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.

Origin: California 1894 (as *Exochomus pilatei* Mulsant): Koebele, 1894: 102; Swezey, 1925c: 374.

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.

Intended target pest: avocado mealybugs: Swezey, 1925c: 374.

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

Collections: none.

Island distribution: none.

9. *Azya orbigera* Mulsant

Purposely introduced, established.

Azya orbigera Mulsant, 1850: 930; Funasaki & Beardsley, 1975: 8; Leeper, 1976: 286; Lai & Funasaki, 1986: 9; Funasaki *et al.*, 1988: 113; Nishida, 2002: 50; BMASC; DoA.

Azya luteipes Mulsant: (misidentified) Kotinsky, 1909: 109; Fullaway, 1914: 8; Swezey, 1923b: 300; Swezey, 1925c: 370; Swezey, 1925d: 366; Swezey, 1927a: 348; Swezey, 1931c: 369; Swezey, 1931b: 487; Hartung, 1932: 26; Swezey, 1935b: 97; Illingworth, 1938a: 3; Pemberton & Williams, 1938: 217; Swezey, 1943b: 6; Krauss, 1944b: 86; Fullaway, 1947: 52; Zimmerman, 1948c: 271, 311; Swezey, 1954: 81; Funasaki & Beardsley, 1975: 8; Leeper, 1976: 286.

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

Azya lutipes: (misidentified, misspelled) Fullaway, 1920: 241.

Azya lutiepes: (misidentified, misspelled): Ehrhorn, 1916: 144.

*Azya orbiger*a (Mulsant): Charanasri & Nishida, 1975: 27.

*Azya orbiger*a: 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 lutiepes*): Ehrhorn, 1916: 144.

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

No Origin 1908 (as *Azya orbiger*a 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.

Asterolecanium spp.: Lai & Funasaki, 1986: 9.

Collections: BM, DoA, UH.

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

Discussion: Funasaki & Beardsley (1975: 8) discussed the misidentification of *Azya orbiger*a 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 Swartz: 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 Swartz: Koebele, 1897a: 78; Koebele, 1897b: 120; Koebele, 1898a: 218; Leeper, 1976: 289.

Coelophora pupillata (Swartz): Zimmerman, 1948c: 129; Paulson & Kumashiro, 1985: 106; Lai & Funasaki, 1986: 25; Funasaki *et al.*, 1988: 114.

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.

Intended target pest: plant lice: Swezey, 1923b: 301; Swezey, 1925c: 371; Swezey, 1925d: 364-365.
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 (Fabricius, 1798: 78): Leeper, 1976: 286; Mau, 1976a: 170; Beardsley, 1981b: 323; Nishida, 2002: 50; Starr *et al.*, 2006: 49; BMASC.

Brumoides suturalis: Tavares *et al.*, 2013: 1.

Coccinella suturalis (Fabricius): Leeper *et al.*, 1976: 286.

Coccinella suturalis: BMASC.

Origin: advantageous, accidental 1974: Mau, 1976a: 170.

Intended target pest: none.

Collections: BM, DoA, UH.

Island distribution: Niihau, Oahu.

12. *Calvia decimguttata* (Linnaeus)

Purposely introduced, not established.

Calvia decimguttata (Linnaeus, 1767: 367): Nishida, 2002: 50.

Calvia 10-guttata (Linnaeus): Timberlake, 1943: 20.

Origin: Japan 1895 (as *Calvia 10-guttata* (Linnaeus)): Timberlake, 1943: 20.

Intended target pest: mildew: 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 bipustulatus Linnaeus: Weber, 1953: 129; Lai & Funasaki, 1986: 20.

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

Origin: California 1952 (as *Chilocorus bipustulatus* Linnaeus): Weber, 1953: 129; Lai & Funasaki, 1986: 20.

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.

Chilochorus cacti Linnaeus: (misspelling) Koebele, 1894: 102; Koebele, 1897b: 131-132; Koebele, 1907: 160.

Chilocorus cacti: Perkins & Swezey, 1924: 27.

Chilochorus cactii Linnaeus: (misspelling) Koebele, 1898b: 265.

Origin: California 1894 (as *Chilochorus cacti* Linnaeus): Koebele, 1894: 102.

California and Mexico 1896 1902 1906 1908 (as *Chilocorus cacti* Linnaeus): Swezey, 1925c: 373; Swezey, 1931c: 373; Lai & Funasaki, 1986: 20.

California and Mexico 1896 1902 1906 (as *Chilocorus cacti* Linnaeus): DoA.

Mexico 1924 (as *Chilocorus cacti*): Perkins & Swezey, 1924: 27.

Arizona 1902 (as *Chilochorus cacti* Linnaeus): Koebele, 1907: 160.

No Origin 1906 (as *Chilochorus cacti* 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 in Schonherr, 1808: 152): Nishida, 2002: 50.

Coccinella circumdata Schonherr: Leeper, 1976: 287.

Chilochorus circumdatus Schonherr: (misspelling, misidentified author): Koebele, 1897b: 132; Koebele, 1898b: 265.

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

Chilocorus circumdatus (Schonherr): (misidentified author) Ehrhorn *et al.*, 1913: 299; Ehrhorn, 1933: 223; Zimmerman, 1948c: 311, 390; Leeper, 1976: 287; Lai & Funasaki, 1986: 20; Funasaki *et al.*, 1988: 113; DoA.

Chilocorus circumdatus Schonherr: (misidentified author) Terry, 1904a: 300; Kotinsky, 1906e: 118; Silvestri, 1910: 308; Ehrhorn *et al.*, 1913: 299; Swezey, 1923b: 300; Swezey, 1925c: 370; Swezey, 1925d: 364; Timberlake, 1927: 532; Illingworth, 1929: 248; Swezey, 1931c: 369; Swezey, 1935b: 97; Illingworth, 1938b: 24; Pemberton & Williams, 1938: 217; Swezey, 1943b: 5.

Chilocorus circumdatus: Compere, 1899: 261; Kotinsky, 1905a: 156; Fullaway, 1909: 25; Kirkaldy, 1909a: 412; Bryan, 1915: 394; Fullaway, 1920: 243; Perkins, 1925: 360; Perkins, 1943: 2; Leeper, 1976: 287.

Chilocorus corcumdatus 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.

No Origin 1895 (*Chilocorus circumdatus* (Schonherr)): Funasaki *et al.*, 1988: 113.

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

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

Lecaniinae, *Asterolecanium* 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, 1798: 79): Leeper, 2014: 1.

Chilocorus nigritus (Fabricius): (misspelling) Davis, 1959: 65; Davis & Chong, 1968: 30; Tsuda, 1974: 317; Davis, 1974: 357; Leeper, 1976: 287; Lai & Funasaki, 1986: 20; Funasaki *et al.*, 1988: 113; Nishida, 2002: 50; Leeper, 2014: 2; DoA.

Chilocorus nigritus Fabricius: (misspelling) Davis, 1972: 188.

Chilocorus nigritus: (misspelling) Leeper, 1976: 287; Tavares *et al.*, 2012: 1.

Coccinella nigrita Fabricius: Leeper, 1976: 287.

Origin: Ceylon 1958 (as *Chilocorus nigritus* (Fabricius)): Davis, 1959: 65; Leeper, 1976: 287.

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

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

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

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

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

Aspidiotus destructor Signoret.: Davis, 1972: 188; Davis, 1974: 357; Lai & Funasaki, 1986: 20.

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.

Chilochorus bivulnerus: Koebele, 1897b: 132; Koebele, 1898b: 265; Kotinsky, 1906c: 416.

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

Chilochorus 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.

Origin: California 1891 1894 (as *Chilocorus bivulnerus* Mulsant, Disappeared after 1896): Swezey, 1925c: 371; Swezey, 1931c: 372.

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

Australia 1891 (as *Chilochorus 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 *Chilochorus 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 *Chilochorus 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.

Chilochorus 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.

Japan 1897 or earlier (as *Chilochorus similis* Rossi): Koebele, 1897b: 132.

Japan 1905 (as *Chilocorus similis* Rossi): Kotinsky, 1905b: 266; Kirkaldy, 1909a: 412.

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.

Coccidophilus citricola: Fullaway, 1952: 104.

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.

Coccinella californica Mannerheim, 1843: 312; Koebele, 1894: 102; Koebele, 1897a: 75; Koebele, 1897b: 116; Koebele, 1898a: 215; Swezey, 1923b: 301; Swezey, 1925c: 374; Swezey, 1931c: 370; Hoyt, 1936: 148; Adachi, 1952: 362; Suehiro, 1958: 334; Davis & Chong, 1968: 30; Lai & Funasaki, 1986: 23; Nishida, 2002: 50; BMASC; DoA.

Coccinella californica: Kotinsky, 1906e: 117; Silvestri, 1910: 313; Davis & Krauss, 1964: 396.

Origin: California 1893 1905 and 1963 (as *Coccinella californica* Mannerheim): Lai & Funasaki, 1986: 23; DoA.

California 1893 1905 (as *Coccinella californica* Mannerheim): Swezey, 1923b: 301; Swezey, 1925c: 370.

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.

California 1963 (as *Coccinella californica*): Davis & Krauss, 1964: 396.

Intended target pest: plant lice: Swezey, 1923b: 301; Swezey, 1925c: 370.

aphids: Davis & Krauss, 1964: 396; Lai & Funasaki, 1986: 23; DoA.

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 var. bruckii Mulsant: (misspelling) Nakao, 1970: 503; Leeper, 1976: 288.

Coccinella 7-punctata brucki Mulsant: (misspelling) Funasaki *et al.*, 1988: 113.

Coccinella bruckii Mulsant: (misspelling) Swezey, 1925c: 374; Swezey, 1931c: 373.

Coccinella bruckii: (misspelling) Ehrhorn, 1914c: 12, Agee, 1914: 306; Swezey, 1914b: 432.

Coccinella brucki: Leeper, 1976: 287; BMASC.

Coccinella septempunctata brucki Mulsant: Leeper, 1976: 287; Leeper, 1977a: 390.

Coccinella septempunctata bruckii Mulsant: (misspelling) Leeper, 1976: 287.

Coccinella septempunctata var. brucki Mulsant: Beardsley, 1977: 400; Mau, 1977c: 413; Beardsley, 1977: 400.

Coccinella septempunctata subsp. brucki: BMASC.

Coccinella septempunctata Mulsant: Davis, 1979: 19.

Coccinella septempunctata: Tavares *et al.*, 2012: 1; Tavares *et al.*, 2013: 1.
Origin: Germany 1909 (as *Coccinella septempunctata* Linnaeus): 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.
Japan 1913 (as *Coccinella bruckii*): Agee, 1914: 306; Swezey, 1914b: 432.
Okinawa 1958 (as *Coccinella 7-punctata* var. *brucki* Mulsant): Nakao, 1970: 503; Lai & Funasaki, 1986: 24; DoA.
No Origin 1958 (as *Coccinella 7-punctata brucki* Mulsant): Funasaki *et al.*, 1988: 113.
Intended target pest: plant lice: Swezey, 1925c: 374.
aphids: Lai & Funasaki, 1986: 24; DoA.
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 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 repanda Thunberg: Swezey, 1905: 228; Kotinsky, 1906c: 417; Kotinsky, 1906e: 118; Kirkaldy, 1907b: 81; Kotinsky, 1908: 8; Giffard, 1908a: 173; Swezey, 1925c: 374; Swezey, 1931c: 373; Timberlake, 1943: 14; Pemberton, 1948: 76; Zimmerman, 1948c: 75 111; Lai & Funasaki, 1986: 24; DoA.
Coccinella repanda (Thunberg): Marsden, 1894: 31.
Coccinella repanda: Perkins, 1903: 16; Perkins, 1904: 497; Terry, 1904a: 299; Van Dine, 1904: 23; Kotinsky, 1905a: 156; Kotinsky, 1906a: 8; Perkins, 1906a: xvi; Perkins, 1906b: 504; Swezey, 1906a: 17; Swezey, 1906a: 18; Craw, 1906b: 150; Muir, 1907: 74; Craw, 1907: 152; Kirkaldy, 1907a: 100 & 101; Fullaway, 1909: 25; Kirkaldy, 1909b: 53; Fullaway, 1912: 10; Williams, 1920: 332; Muir, 1921: 121; Pemberton, 1964a: 704; 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 repanta* 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.
Intended target pest: plant lice: Swezey, 1925c: 374.
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 tri fasciata*) 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.

Coelophora atrolineata Fairmaire, 1881: 491; Davis, 1961a: 325; Davis, 1961b: 391; Davis & Chong, 1968: 30; Lai & Funasaki, 1986: 24; Nishida, 2002: 50; BMASC; DoA.

Origin: Fiji 1960 (as *Coelophora atrolineata* Fairmaire): Davis, 1961a: 325; Davis, 1961b: 391; Lai & Funasaki, 1986: 24; DoA.

Intended target pest: *Coccus viridis* (Green) (green scale): Davis, 1961b: 391.

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.

Intended target pest: *Psylla*: 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 &

Williams, 1932: 184; Swezey, 1936: 84; Swezey, 1937: 435; Swezey, 1939c: 189; Holdaway & Look, 1942: 257; Swezey, 1943b: 5; Timberlake, 1943: 31; Krauss, 1944b: 86; Fullaway & Krauss, 1945: 75; Krauss, 1945: 313; Swezey, 1946: 470; Fullaway, 1947: 52; Zimmerman, 1948a: 101; Zimmerman, 1948b: 239; Zimmerman, 1948c: 66, 77, 80, 87; Swezey, 1954: 108; Nishida, 1958: 383; Beardsley & Tuthill, 1959: 59; Davis, 1959: 64; Beardsley, 1961: 352; Pemberton, 1964a: 704; Beardsley, 1966: 124; Davis & Chong, 1968: 30; Beardsley, 1970b: 490; Leeper & Beardsley, 1973: 8a; Leeper, 1975: 62; Leeper, 1976: 288; Leeper & Beardsley, 1976: 314; Suehiro, 1986: 50; Lai & Funasaki, 1986: 24; Funasaki *et al.*, 1988: 114; Nishida, 2002: 50; Uchida *et al.*, 2003: 138; Starr *et al.*, 2006: 49; BMASC; DoA.

Coccinella inaequalis subsp. *comperei*: Timberlake, 1943: 31.

Coccinella inaequalis subsp. *novemmaculata*: BMASC.

Coccinella inaequalis var. *novemmaculata* (Fabricius, 1781: 80): Leeper, 1976: 288; Nishida, 2002: 50; DoA.

Coccinella inaequalis Fabricius: Zimmerman, 1948c: 100.

Coccinella inaequalis Fabricius: (misspelling) Illingworth, 1929: p. 249; Leeper, 1976: 288.

Coccinella novemmaculata Fabricius: Leeper, 1976: 289.

Coccinella repanda Thunberg: (misidentification) Giffard, 1908a: 173; Zimmerman, 1948c: 75, 87.

Coccinella repanda: (misidentification) Kotinsky, 1906: p. 8; Giffard, 1908a: 173; Giffard, 1908b: 181; Perkins, 1925: 360; Perkins, 1943: 2; Pemberton, 1964a: 704; Leeper, 1976: 288.

Coelophora inaequalis Fabricius: Giffard, 1908a: 173, Marsh, 1911: 160; Anonymous, 1951: 219; Leeper, 1976: 288; Lai, 1988: 181.

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 subsp. *comperei*: BMASC.

Coelophora inaequalis subsp. *novemmaculata*: BMASC.

Coelophora inaequalis subsp. *novempunctata*: 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.

Australia and Philippines 1958 (as *Coelophora inaequalis* (Fabricius)): Lai & Funasaki, 1986: 24.

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.

aphids, *Aphis gossypii* Glover: Lai & Funasaki, 1986: 24; DoA.

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: BMASC.

Coelophora saucia calypso Mulsant: Nishida, 2002: 50.

Coelophora saucia subsp. *calypso* Mulsant: BMASC.

Lemnia saucia calypso (Mulsant): Timberlake, 1943: 30.

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 cubensis Casey: Weber, 1953: 128; Lai & Funasaki, 1986: 25; DoA.

Coleomegilla vittigera: (misidentification) Fullaway, 1952: 104.

Origin: Cuba 1952 (as *Coleomegilla cubensis* Casey): Weber, 1953: 128; Lai & Funasaki, 1986: 25; DoA.

Intended target pest: aphids: Weber, 1953: 128; Lai & Funasaki, 1986: 25; DoA.

Collections: none.

Island distribution: none.

31. *Cryptognatha nodiceps* Marshall

Purposely introduced, not established.

Cryptognatha nodiceps Marshall, 1912: 321; Swezey *et al.*, 1939: 351; Au, 1970: 482; Davis, 1970: 523; Davis, 1972: 190; Lai & Funasaki, 1986: 27; Gonzalez-Hernandez, 1995: 118; Nishida, 2002: 50; BMASC; DoA.

Cryptognatha nodiceps: Fullaway, 1952: 104.

Origin: Fiji 1936 & 1969; Trinidad 1969 (as *Cryptognatha nodiceps* Marshall): Lai & Funasaki, 1986: 27; DoA.

Fiji 1938 (as *Cryptognatha nodiceps* Marshall): Swezey *et al.*, 1939: 351.

No origin 1936 and Fiji 1969 (as *Cryptognatha nodiceps* Marshall): Au, 1970: 482.

Fiji and Trinidad 1969 (as *Cryptognatha nodiceps* Marshall): Davis, 1970: 523.

Intended target pest: Diaspine coccid: Swezey *et al.*, 1939: 351.

scales (Diaspididae): Lai & Funasaki, 1986: 27; DoA.

Collections: none.

Island distribution: Oahu.

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 nigripennis Weise: Pemberton & Williams, 1938: 218; Swezey, 1939a: 180; Swezey, 1939b: 186; Swezey *et al.*, 1939: 350; Zimmerman, 1948c: 390; Lai & Funasaki, 1986: 27.

Cryptogonus orbiculatus Gyllenhal: Koebele, 1897a: 78; Koebele, 1897b: 120; Koebele, 1898a: 218; Swezey, 1923b: 300.

Coccinella orbiculus: BMASC.

Diomus futahoshii Ohta: Chapman, 1938: 323; Gonzalez-Hernandez, 1995: 12; Pandey, 2002: 26.

Origin: Japan 1894 (as *Cryptogonus orbiculus* (Gyllenhal)): Swezey, 1925c: 370; Lai & Funasaki, 1986: 27; DoA.

Japan 1894 (as *Cryptogonus orbiculatus* Gyllenhal): Koebele, 1897b: 120; Swezey, 1923b: 300.

Formosa 1933 (as *Diomus futahoshii* Ohta): Chapman, 1938: 323; Gonzalez-Hernandez, 1995: 12; Pandey, 2002: 26.

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.

Discussion: Swezey (1923b: 300 & 1925c: 370) noted "Abundant in 1897, but later disappeared." Sasaji (1971: 195) and Poorani (2002: 51) list *Diomus futahoshii* Ohta as a synonym of *Cryptogonus orbiculus* (Gyllenhal).

33. *Cryptolaemus montrouzieri* Mulsant

Purposely introduced, established.

Cryptolaemus montrouzieri Mulsant, 1853: 140; Koebele, 1897a: 67; Koebele, 1897b: 106-107; Koebele, 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;

Davis, 1953: 85; Swezey, 1954: 22; Zimmerman, 1957: 198; Tanada & Beardsley, 1958: 431; Beardsley & Tuthill, 1959: 59; Pemberton, 1964a: 702; Dizon, 1964: 1; Davis & Chong, 1968: 26; Leeper & Beardsley, 1973: 8a; Leeper, 1975: 62; Leeper, 1976: 289; Leeper & Beardsley, 1976: 314; Stein & Onaga, 1983: 180; Suehiro, 1986: 50; Funasaki *et al.*, 1988: 110 and 122; Lai 1988: 182; Gonzalez-Hernandez, 1995: 11; Samuelson, 1998: 29; Nishida, 2002: 50; Pandey, 2002: 26; Ramsdale & Samuelson, 2006: 33; Hue *et al.*, 2007: 2; Starr & Starr, 2011: 35; DoA.

Cryptolaemus montrouzieri (Mulsant): Marsden, 1894: 32; Charanasri & Nishida, 1975: 27.

Cryptolaemus montrouzieri: Koebele, 1896: 596; Kotinsky, 1905a: 153 & 156; Swezey, 1906a: 18; Craw, 1907: 156; Kirkaldy, 1907a: 101; Kotinsky, 1907: 305; Giffard, 1908b: 181; Fullaway, 1909: 25; Kotinsky, 1909: 111; Silvestri, 1910: 313; Swezey, 1910: 114; Ehrhorn, 1911a: 115; Ehrhorn, 1911b: 143; Ehrhorn, 1914a: 1; Ehrhorn, 1915a, plate 17 across from p. 138; Bryan, 1915: 394; Fullaway, 1920: 240; Fullaway, 1922a: 11; Fullaway, 1923a: 319; Fullaway, 1924b: 432; Perkins, 1925: 360; Perkins, 1943: 2; Swezey, 1943a: 286; Fullaway, 1952: 104; Gagne, 1979: 72; Davis *et al.*, 1992: 424; Gonzalez-Hernandez, 1995: 118; Jahn *et al.*, 2003: 27.

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

Cryptolaemus: Muller, 1895: 261; Perkins, 1904: 497; Kotinsky, 1906b: 9; Timberlake, 1927: 532; Bess, 1951: 207.

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

Cryptolaemus?: Wait, 1895: 349; Kirkaldy, 1909a: 411.

Cryptolaemus Monstraeusers: Wait, 1895: 350.

Rhizobius montrouzieri: 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.

Australia via California 1893 (as *Cryptolaemus montrouzieri* Mulsant): Samuelson, 1998: 29.

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

Australia 1894 (as *Cryptolaemus montrouzieri* Mulsant): Gonzalez-Hernandez, 1995: 11.

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

Australia 1893 (as *Cryptolaemus montrouzieri* Mulsant): Dizon, 1964: 1.

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

California 1933 (as *Cryptolaemus montrouzieri* Mulsant): Swezey *et al.*, 1939: 352; Chapman, 1938: 322; Pandey, 2002: 26.

California 1949; Mexico via Australia 1949 (as *Cryptolaemus montrouzieri* Mulsant): Zimmerma, 1957: 198.

California 1967 (as *Cryptolaemus montrouzieri* Mulsant): Davis & Chong, 1968: 26.

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

No Origin 1894 (as *Cryptolaemus montrouzieri*): Perkins, 1943: 2.

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

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

Intended target pest: Pseudococcus brevipes: Chapman, 1938: 320 & 322; Swezey *et al.*, 1939: 352.

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.

Curinus coeruleus Mulsant, 1850: 472; Swezey, 1923b: 300; Fullaway, 1923b: 63; Swezey, 1925c: 370; Swezey, 1928a:27; Swezey, 1931c: 369; Chapman, 1938: 320; Fullaway, 1947: 52; Beardsley & Tuthill, 1959: 59; Leeper, 1976: 291; Leeper & Beardsley, 1976: 314; Mau, 1977c: 413; Paulson & Kumashiro, 1985: 106; Suehiro, 1986: 37 & 50; Lai & Funasaki, 1986: 27; Funasaki *et al.*, 1988: 114; Takara *et al.*, 1990: 28; Nishida, 2002: 50; Hue *et al.*, 2007: 2; BMASC; DoA.

Curinus coeruleus (Mulsant): Fullaway, 1924a: 371; Swezey, 1929: 272; Osborn, 1938: 154; Swezey, 1935b: 97; Swezey, 1936: 89; Swezey, 1939c: 189; Krauss, 1944b: 86; Krauss, 1945: 314; Zimmerman, 1948c: 229, 369; Swezey, 1952: 378; Gonzalez-Hernandez, 1995: 110; Samuelson, 1998: 29; Jahn *et al.*, 2003: 27; Starr *et al.*, 2006: 49; Yang, 2006: 127.

Curinus caeruleus (Mulsant): (misspelling) Leeper, 1975: 62.

Curinus coeruleus: Fullaway, 1923b: 64; Fullaway, 1925: 31; Fullaway, 1932: 6; Leeper, 1976: 291; Mau, 1977b: 411; Tavares *et al.*, 2012: 1; Tavares *et al.*, 2013: 1.

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

Orcus (Curinus) coeruleus Mulsant: Leeper & Beardsley, 1973: 8a; Leeper, 1976: 291.

Origin: Mexico 1922 (as *Curinus coeruleus* Mulsant): Swezey, 1923b: 300; Swezey, 1925c: 370; Swezey, 1931c: 369; Chapman, 1938: 320; Samuelson, 1998: 29; Lai & Funasaki, 1986: 27; DoA.

Mexico 1922 (as *Curinus coeruleus*): Osborn, 1938: 154.

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

No Origin 1922 (as *Curinus coeruleus* Mulsant): Funasaki *et al.*, 1988: 114.

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

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

Pseudococcus nipae (Maskell): Fullaway, 1923b: 63.

Pseudococcus nipae: Swezey, 1923b: 300; Swezey, 1925c: 370; Chapman, 1938:

320.

Collections: BM, DoA, UH.

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

35. *Cycloneda conjugata* (Mulsant)

Adventive introduction, not established.

Cycloneda conjugata (Mulsant, 1850: 313): Culliney & Nagamine, 2000: 106; Nishida, 2002: 50; BMASC.

Origin: Trinidad and Tobago 1985 (as *Cycloneda conjugata* (Mulsant): Culliney & Nagamine, 2000: 106.

Intended target pest: *Heteropsylla cubana* (Crawford): Culliney & Nagamine, 2000: 106.

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 sanguinea limbifer Casey, 1899: 92; Nishida, 2002: 50.

Cycloneda limbifer Casey: Weber, 1953: 128; Lai & Funasaki, 1986: 28; DoA.

Cycloneda limbifer: Fullaway, 1952: 104; BMASC.

Cycloneda sanguinea subsp. *limbifer* Casey: BMASC.

Cycloneda sanguinea Linnaeus: Koebele, 1894: 102; Koebele, 1898b: 265; Swezey, 1925c: 373; Weber, 1956: 164.

Cycloneda sanguinea Linnaeus: (misspelling) DoA.

Origin: California 1894(as *Cycloneda sanguinea* Linnaeus): Koebele, 1894: 102.
California 1896 1955 (as *Cycloneda sanguinea* Linnaeus): Swezey, 1925c: 373.
Cuba 1952 (as *Cycloneda limbifer* Casey): Weber, 1953: 128; Lai & Funasaki, 1986: 28; DoA.
Mexico 1896; California 1955 (as *Cycloneda sanquinea* Linnaeus): (misspelling) DoA.
Mexico 1896 and 1955 (as *Cycloneda sanguinea* Linnaeus): Weber, 1956: 164.
Intended target pest: aphids: Weber, 1953: 128; Weber, 1956: 164; Lai & Funasaki, 1986: 28; 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 sanguinea Linnaeus, 1763: 10; Nishida, 2002: 50.
Cycloneda sanguinea (Linnaeus): Williams, 1931: 373; Weber, 1955: 164; Kumashiro *et al.*, 2001: 172.
Cycloneda sanguinea Linnaeus: Koebele, 1894: 102; Koebele, 1897b: 131; Swezey, 1931c: 373; BMASC; DoA.
Cycloneda sanguinea subsp. *sanguinea*: BMASC.
Cycloneda sanquinea Linnaeus): (misspelling) Lai & Funasaki, 1986: 28.
Origin: Mexico 1896; California and Mexico 1955 (as *Cycloneda sanguinea* Linnaeus): DoA.
Mexico 1896 (as *Cycloneda sanguinea* Linnaeus): Swezey, 1931c: 373.
Mexico 1896 and California 1955 (as *Cycloneda sanquinea* Linnaeus): Lai & Funasaki, 1986: 28.
California 1890s and Mexico 1955 (as *Cycloneda sanguinea* (Linnaeus)): Kumashiro *et al.*, 2001: 172.
Mexico 1955 (as *Cycloneda sanguinea* Linnaeus): Weber, 1955: 164.
Intended target pest: aphids: Lai & Funasaki, 1986: 28.
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.
Hyperaspis quinquenotata Mulsant: (see Discussion) Chapman, 1938: 325; Gonzalez-Hernandez, 1995: 12; Pandey, 2002: 27.
Origin: Brazil 1936 (as *Hyperaspis quinquenotata* Mulsant): (see Discussion) Chapman, 1938: 325; Gonzalez-Hernandez, 1995: 12; Pandey, 2002: 27.
Intended target pest: *Pseudococcus brevipes*: Chapman, 1938: 325.
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 (LeConte): (misidentification) Lai *et al.*, 1982: 110; Lai & Funasaki, 1985: 83; Paulson & Kumashiro, 1985: 106; Lai & Funasaki, 1986: 29; Funasaki *et al.*, 1988: 101; Funasaki *et al.*, 1988: 115; Lai, 1988: 180; Nishida, 2002: 50; BMASC.

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

Delphastus pussillus (LeConte): (misspelling, misidentification) Higa, 1983b: 168.

Oeneis pusillus: BMASC.

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

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

Trinidad 1980 (as *Delphastus pussillus* (LeConte)): (misspelling, misidentification) Higa, 1983b: 168; Lai *et al.*, 1986: 29.

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.

Lioscymnus diversipes Champion: Weber, 1954: 370; Anonymous, 1954: 371; Lai *et al.*, 1986: 45; Nishida, 2002: 51; BMASC; DoA.

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.
bamboo scale: Weber, 1954: 370.

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.

Intended target pest: Aphidai: 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.

Diomus debilis (LeConte, 1852: 137): Leeper, 1976: 291; Beardsley, 1981b: 323; Samuelson, 1998: 29; Nishida, 2002: 50; BMASC.

Diomus descendens (Sharp): Bridwell, 1920: 279.

Scimnus debilis LeConte: (misspelling) Bianchi, 1968: 11.

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

Scymnus debilis LeConte: Koebele, 1894: 103; Koebele, 1896: 596; Koebele, 1897b: 116-117; Koebele, 1898a: 216; Kotinsky, 1906c: 416; Koebele, 1907: 159; Swezey, 1928b: 182; Swezey, 1935b: 97; Sakimura *et al.*, 1940: 452; Zimmerman, 1948c: 185, 260, 266; Swezey, 1954: 102; Dizon, 1964: 1; Leeper, 1976: 291.

Scymnus debitis LeConte: (misspelling) Koebele, 1897a: 75.

Scymnus descendens: BMASC.

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

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

No Origin, by 1885 reintroduced 1894 (as *Scymnus debilis* LeConte): Samuelson, 1998: 29.

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

Collections: BM, DoA, UH.

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

Discussion: *Diomus debilis* was described as *Scymnus descendens* 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.

Diomus notescens (Blackburn, 1889: 196): Swezey, 1923b: 301; Swezey, 1925c: 370; Swezey, 1925d: 364; Illingworth, 1927: 393; Swezey & Bryan, 1929: 298; Swezey, 1931c: 370; Williams, 1931: 183; Holdaway & Look, 1942: 258; Swezey, 1943b: 5; Leeper, 1975: 62; Leeper, 1976: 292; Leeper & Beardsley, 1976: 314; Stein & Onaga, 1983: 180; Lai *et al.*, 1986: 31; Funasaki *et al.*, 1988: 115; Nishida, 2002: 50; BMASC; DoA.

Diomus notescens: Tavares *et al.*, 2012: 1; Tavares *et al.*, 2013: 2.

Scymnus notescens Blackburn: Giffard, 1908a: 174; Swezey & Bryan, 1927: 416; Krauss, 1944a: 11; Zimmerman, 1948c: 75, 87 201; Swezey, 1954: 196; Pemberton, 1964a: 704; Leeper & Beardsley, 1973: 8a; Leeper, 1976: 292.

Scymnus notescens (Blackburn): Fullaway, 1909: 25; Bryan, 1926: 282; Swezey, 1934b: 534; Swezey, 1935b: 97; Krauss, 1944b: 86; Leeper, 1976: 292.

Scymnus notescens: Kirkaldy, 1907a: 100 & 101; Kirkaldy, 1909a: 413; Silvestri, 1910: 313; Fullaway, 1912: 10; Bryan, 1917: 295; Williams, 1931: 183; BMASC.

Scymnus notescus (Blackburn): Marsden, 1894: 32.

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

Australia 1894 (as *Scymnus notescens* Blackburn): Giffard, 1908a: 174; Pemberton, 1964a: 704.

Australia 1894 (as *Diomus notescens* (Blackburn)): Swezey, 1923b: 301; Swezey, 1925c: 370; Swezey, 1931c: 370; Williams, 1931: 183; Leeper, 1976: 292; Lai *et al.*, 1986: 31; DoA.

Australia, no date (as *Diomus notescens* (Blackburn)): Swezey, 1925d: 364.

No Origin 1894 (as *Diomus notescens* (Blackburn)): Funasaki *et al.*, 1988: 115.

Intended target pest: plant lice: Swezey, 1923b: 301; Swezey, 1925c: 370; Swezey, 1925d: 364-365.
aphids: Lai *et al.*, 1986: 31; 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 Weise: Leeper, 1975: 65; Leeper, 1976: 292; Leeper & Beardsley, 1976: 314; Lai *et al.*, 1986: 31.

Diomus pumilio: Davis, 1978: 100.

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

Diomus sp.: Leeper & Beardsley, 1975: 8; Nakao *et al.*, 1975: 110; Leeper, 1976: 292.

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

Australia via California 1973 (as *Diomus* sp.): Leeper & Beardsley, 1975: 8; Nakao *et al.*, 1975: 111; Leeper, 1976: 292.

Australia 1973 (as *Diomus pumilio* Weise): Lai *et al.*, 1986: 31; DoA.

Mexico 1922 (as *Diomus ?pumilio* Weise): DoA.

No Origin 1922 (as *Diomus ?pumilio* Weise): Funasaki *et al.*, 1988: 123.

Intended target pest: mealybugs; *Psylla uncatoides* (Ferris & Klyver): DoA.

Psylla uncatoides (Ferris & Klyver): Leeper & Beardsley, 1975: 8; Nakao *et al.*, 1975: 110; Leeper, 1976: 292; Lai *et al.*, 1986: 31.

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 sp. near *pumilio* Weise: Lai *et al.* 1986: 31.

Diomus ?pumilio (Weise): DoA.

Origin: see Discussion

Mexico 1922 (as *Diomus* sp. near *pumilio* Weise): Lai *et al.*, 1986: 31.

Intended target pest: see Discussion.

mealybugs: Lai *et al.*, 1986: 31.

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.

Diomus sp. (four-lined): Swezey, 1923b: 300; Swezey, 1925c: 370; Swezey, 1931c: 369; Chapman, 1938: 320; Gonzalez-Hernandez, 1995: 11.

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.

Mexico 1922 (as *Diomus* sp. (four-lined)): Swezey, 1923b: 300

Intended target pest: mealybugs: Swezey, 1923b: 300; Swezey, 1925c: 370; Lai *et al.*, 1986: 31.

Pseudococcus brevipes: Chapman, 1938: 320.

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.

Origin: Mexico 1922 (as *Diomus* sp.): Swezey, 1923b: 300; Swezey, 1925c: 370; Swezey, 1931c: 369;

Chapman, 1938: 320 & 321; Lai *et al.*, 1986: 31; Gonzalez-Hernandez, 1995: 11; Pandey, 2002: 26; DoA.

Intended target pest: mealybugs: Swezey, 1923b: 300; Swezey, 1925c: 370.

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.

Diomus sp.: Leeper, 1976: 293; Mau, 1977a: 399.

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. *Egias platycephalus* Mulsant

Purposely introduced, not established.

Egias platycephalus Mulsant, 1850: 464; Weber, 1953: 129; Lai *et al.*, 1986: 33; Nishida, 2002: 50; BMASC; DoA.

Origin: Cuba 1952 (as *Egias platycephalus* Mulsant): Weber, 1953: 129; Lai *et al.*, 1986: 33; DoA.

Intended target pest: bamboo and other scales: Weber, 1953: 129.

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.

Erithionyx lanosus (Blackburn): (misspelling) Marsden, 1894: 32.

Origin: Australia 1894 (as *Erithionyx lanosus* (Blackburn)): (misspelling) Marsden, 1894: 32.

Intended target pest: Diaspidinae: 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 melanocephalus (Zoubkoff, 1833: 339): Nishida, 2002: 51; BMASC

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 (20002: 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: Leeper, 1976: 291.

Coccinella chalybea: BMASC.

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

Orcus chalybaeus (Boisduval): (misspelling) Swezey, 1923b: 300; Swezey, 1925c: 370; Swezey, 1925d: 364; Timberlake, 1927: 532; Krauss, 1945: 76; Peterson, 1957: 199; Leeper, 1976: 291.

Orcus chalybeus (Boisduval): Ehrhorn *et al.*, 1913: 299; Swezey, 1931c: 369; Swezey, 1943b: 5; Fullaway & Krauss, 1945: 76; Zimmerman, 1948c: 111, 311; Tanada & Beardsley, 1958: 431; Leeper & Beardsley, 1973: 8a; Charanasri & Nishida, 1975: 27; Leeper, 1975: 62;

Leeper, 1976: 291; Leeper & Beardsley, 1976: 314; Mau, 1977c: 413; Chun, 1981: 325; Paulson & Kumashiro, 1985: 107; Suehiro, 1986: 50; Lai *et al.*, 1986: 55; Funasaki *et al.*, 1988: 118; DoA.

Orcus chalybeus Boisduval: Marsden, 1894: 32; Koebele, 1897 a: 76; Koebele, 1897b: 118; Koebele, 1898a: 217; Compere, 1899: 261; Terry, 1904a: 300; Illingworth, 1929: 248; Pemberton & Williams, 1938: 217; Krauss, 1945: 314.

Orcus chalybeus: Kotinsky, 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) Kotinsky, 1906c: 419.

Orcus chalyboeus: (misspelling) Kirkaldy, 1909a: 412.

Origin: Australia 1894 (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*): Kotinsky, 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.

Harmonia axyridis (Pallas, 1773: 716): Timberlake, 1943: 17.

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.

Harmonia conformis (Boisduval, 1835: 604): Timberlake, 1943: 17; Leeper, 1975: 65; Leeper & Beardsley, 1975: 7; Nakao *et al.*, 1975: 110; Beardsley & Leeper, 1976: 162; Leeper, 1976: 293; Leeper & Beardsley, 1976: 314; Davis, 1979: 19; Beardsley, 1981a: 312; Lai *et al.*, 1986: 39; Funasaki *et al.*, 1988: 116; Lai, 1988: 182; Nishida, 2002: 51; BMASC; DoA.

Callineda conformis (Boisduval): Swezey, 1923b: 301; Swezey, 1925c: 371; Leeper & Beardsley, 1975: 7; Leeper, 1976: 293.

Callineda conformis: BMASC.

Coccinella conformis Boisduval: Leeper, 1976: 293.

Coccinella conformis: Kirkaldy, 1907a: 101; Leeper & Beardsley, 1975: 7; Leeper, 1976: 293; BMASC.

Harmonia conformis: Leeper, 1977b: 482; Davis, 1978: 100; Tavares *et al.*, 2012: 1; Tavares *et al.*, 2013: 3.

Leis conformis Boisduval: Koebele, 1897a: 76; Koebele, 1897b: 118; Koebele, 1898a: 217; Kotinsky, 1906e: 118.

Leis conformis (Boisduval): Marsden, 1894: 31; Kotinsky, 1905a: 153-154 & 156-157; Perkins, 1925: 361; Zimmerman, 1948c: 75; Leeper & Beardsley, 1975: 7; Leeper, 1976: 293.

Leis conformis: Kirkaldy, 1905: 153; Perkins, 1943: 3; BMASC.

Origin: Australia 1894 (as *Leis conformis* (Boisduval)): Marsden, 1894: 31.

Australia, before 1894 1904 (as *Callineda conformis* (Boisduval)) Disappeared after 1906): Swezey, 1923b: 301; Swezey, 1925c: 371.

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.

California 1973 (as *Harmonia conformis* (Boisduval)): Lai *et al.*, 1986: 39; DoA.

No Origin 1973 (as *Harmonia conformis* (Boisduval)): Funasaki *et al.*, 1988: 116.

Intended target pest: plant lice: Swezey, 1923b: 301; Swezey, 1925c: 371.

aphids, *Psylla uncatoides* (Ferris & Klyver): DoA.

aphids: Lai *et al.*, 1986: 39.

Psylla uncatoides (Ferris & Klyver): Leeper & Beardsley, 1975: 7; Nakao *et al.*, 1975: 110; Leeper, 1976: 293; Lai *et al.*, 1986: 39.

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 (Fabricius): Swezey *et al.*, 1939: 350; Weber, 1957: 313; Lai *et al.*, 1986: 39; DoA.

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.

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

Aphis: Swezey *et al.*, 1939: 350

aphids, scales, and aleurodids: Weber, 1957: 313.

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.

Callineda testudinaria Mulsant: Swezey, 1905: 224; Fullaway *et al.*, 1922: 27.

Callineda testudinaria: Terry, 1906: 12; Swezey, 1906b: 27; Perkins, 1906b: 504; Perkins, 1906c: 195; Kirkaldy, 1909a: 417; Kirkaldy, 1909b: 52; Silvestri, 1910: 316.

Leis testudinaria (Mulsant): Timberlake, 1927: 536.

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

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

Neda testudinaria: Marsden, 1894: 31; Kotinsky, 1905a: 154.

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.

Harmonia testudinea (Wollaston, 1854: 67): Nishida, 2002: 51; BMASC.

Adalia testudinea (Wollaston): Davis & Chong, 1968: 28.

Adalia testudinea (Wollaston): BMASC.

Origin: 1962: Davis & Chong, 1968: 28.

Intended target pest: none.

Collections: none.

Island distribution: none.

62. *Hippodamia convergens* Guerin-Meneville

Purposely introduced, established.

Hippodamia convergens Guerin-Meneville, 1842: 321: Lai, 1988: 183; Nishida, 2002: 51.

Hippodamia convergens Guerin: Swezey, 1925c: 273; Swezey, 1931c: 373; Weber, 1953: 129;

Davis & Krauss, 1964: 396; Beardsley, 1965a: 25; Beardsley, 1965b: 34; Bianchi, 1965: 27; Chong,

1965: 38; Leeper & Beardsley, 1973: 8a; Leeper, 1975: 62; Leeper, 1976: 294; Leeper &

Beardsley, 1976: 314; Mau, 1977c: 413; Davis, 1979: 19; Lai *et al.*, 1986: 40; Funasaki *et al.*, 1988: 116; DoA.

Hippodamia convergens, Lex. H., Guer.: Koebele, 1894: 101.

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

Origin: California 1894 (as *Hippodamia convergens*, Lex. H., Guer.): Koebele, 1894: 101.

California 1896 1905 1910 (as *Hippodamia convergens* Guerin): Swezey, 1925c: 373; Swezey, 1931c: 373.

California 1896 1905 1910 1952 (as *Hippodamia convergens* Guerin): Weber, 1953: 129; Beardsley, 1965a: 26.

California 1896 1905 1910 1952 1963 (as *Hippodamia convergens* Guerin): Lai *et al.*, 1986: 40; DoA.

California 1910 (as *Hippodamia convergens*): Ehrhorn, 1910b: 79.

California 1911 (as *Hippodamia convergens*): Ehrhorn, 1911b: 143.

California 1963 (as *Hippodamia convergens* Guerin): Davis & Krauss, 1964: 396.

No Origin 1896 (as *Hippodamia convergens* Guerin): Funasaki *et al.*, 1988: 116.

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

aphids: Weber, 1953: 129; Davis & Krauss, 1964: 396; Lai *et al.*, 1986: 40; DoA.

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 5-signata punctulata LeConte: Williams, 1948: 203; Adachi, 1952: 361; Leeper, 1976: 294; Leeper, 2014: 3.

Hippodamia ambigua LeConte: Swezey, 1925c: 374; Swezey, 1931c: 373; Lai *et al.*, 1986: 40; Nishida, 2002: 51; Leeper, 2014: 3; BMASC; DoA.

Hippodamia ambigua, Lex. H., Guer.: Koebele, 1894: 101.

Hippodamia ambigua: Kotinsky 1906e: 117; Silvestri, 1910: 313.

Hippodamia punctulata LeConte: Leeper, 1976: 294.

Hippodamia quinquesignata: Fullaway, 1952: 104; Leeper, 2014: 3; BMASC.

Hippodamia quinquesignata punctulata LeConte: Weber, 1953: 129; Weber, 1955: 637; Leeper, 1976: 294; Lai *et al.*, 1986: 40; Nishida, 2002: 51; Leeper, 2014: 3; DoA.

Hippodamia quinquesignata subsp. *punctulata* LeConte: Leeper, 2014: 3.

Hippodamia quinquesignata subsp. *punctulata*: Leeper, 2014: 3; BMASC.

Hippodamia 5-signata subsp. *punctulata*: BMASC.

Origin: California 1894 (as *Hippodamia ambigua*, Lex. H., Guer.): Koebele, 1894: 101.

California 1905 (as *Hippodamia ambigua* LeConte): Swezey, 1925c: 374; Swezey, 1931c: 373; Lai *et al.*, 1986: 40; DoA.

California 1952 (as *Hippodamia quinquesignata punctulata* LeConte): Weber, 1953: 129; Weber, 1955: 637; Leeper, 1976: 294; Lai *et al.*, 1986: 40; DoA.

Intended target pest: aphids: Weber, 1953: 129; Weber, 1955: 637; 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.

Origin: California 1894 (as *Hippodamia sinuata* Mulsant: Koebele, 1894: 102.

Intended target pest: plant lice: Koebele, 1894: 102.

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.

Adonia variegata (Goeze): Davis & Chong, 1968: 28; Lai *et al.*, 1986: 1.

Origin: Madeira 1962 (as *Adonia variegata* (Goeze)): Davis & Krauss, 1963: 248.

Madeira 1962 (as *Hippodamia variegata* (Goeze)): Lai *et al.*, 1986: 1; DoA.

Intended target pest: aphids: Lai *et al.*, 1986: 1; DoA.

Aphids and Coccids: Davis & Krauss, 1963: 248.

Collections: none.

Island distribution: none.

66. *Hyperaspidium comparatus* Casey

Purposely introduced, not established.

Hyperaspidium 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 *Hyperaspidium comparatus* Casey): Swezey, 1925c: 373; Swezey, 1931c: 372; Chapman, 1938: 320; DoA.

No Origin 1893 (as *Hyperaspidium comparatus* Casey): Koebele, 1907: 159.

California 1893 (as *Hyperaspidium comparatus* Casey): Chapman, 1938: 320; Lai *et al.*, 1986: 42; Gonzalez-Hernandez, 1995: 11.

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

Pseudococcus brevipes: Chapman, 1938: 320.

Collections: none.

Island distribution: none.

67. *Hyperaspidium vittigerus* (LeConte)

Purposely introduced, not established.

Hyperaspidium 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.

Hyperaspidium trimaculatus (Linnaeus, 1767: 592): Koebele, 1894: 103; Nishida, 2002: 51.

Origin: California 1894 (as *Hyperaspidium trimaculatus* Linnaeus): Koebele, 1894: 103.

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

Collections: none.

Island distribution: none.

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

68. *Hyperaspis albicollis* Gorham

Purposely introduced, not established.

Hyperaspis albicollis Gorham, 1894: 201; Swezey, 1931c: 373; Chapman, 1938: 321; Weber, 1955: 637; Lai *et al.*, 1986: 42; Gonzalez-Hernandez, 1995: 11; Nishida, 2002: 51; Pandey, 2002: 26; BMASC; DoA.

Hyperaspis albicollis: Fullaway, 1925: 34; Fullaway, 1952: 104.

Hyperaspis languida (Mulsant) (= *albicollis* Gorham): Davis & Chong, 1968: 31.

Origin: Panama 1924 (as *Hyperaspis albicollis* Gorham): Swezey, 1931c: 373; Chapman, 1938: 321; Lai *et al.*, 1986: 42; Gonzalez-Hernandez, 1995: 11; Pandey, 2002: 26; DoA.

Panama 1924, 1946, 1954 (as *Hyperaspis albicollis* Gorham): Weber, 1955: 637.

Intended target pest: *Pseudococcus brevipes*: Chapman, 1938: 321.

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

mealybugs: Weber, 1955: 637.

Collections: none.

Island distribution: none.

69. *Hyperaspis annularis* Boheman

Introduction dubious, not established.

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

Hyperaspis annularis: Illingworth, 1923a: 24.

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.

Hyperaspis C-nigrum: Fullaway, 1952: 104.

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

Hyperaspis nigrum Mulsant: Gonzalez-Hernandez, 1995: 12.

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

Brazil 1935 (as *Hesperaspis c-nigrum* Mulsant): (misspelling) Pandey, 2002: 27.

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

Brazil 1935-36 (as *Hyperaspis nigrum* Mulsant): Gonzalez-Hernandez, 1995: 12.

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 Melsheimer, 1847: 180; Leeper, 1976: 294; Lai *et al.*, 1986: 42; Funasaki *et al.*, 1988: 111 and 123; Nishida, 2002: 51; BMASC; DoA.

Hyperaspis fimbriolata Mulsant: Koebele, 1894: 103.

Hyperaspis limbalis Casey: Beardsley, 1963: 195; Beardsley, 1967: 338; Leeper, 1976: 294.

Hyperaspis limbalis Casey (?): Beardsley, 1967: 338.

Hyperaspis limbalis: Beardsley, 1967: 338; BMASC.

Hyperaspis limbatus Casey: Koebele, 1907: 159; Swezey, 1925c: 374; Swezey, 1931c: 373; Chapman, 1938: 321; Anonymous, 1955: 673; Beardsley, 1955: 385; Leeper, 1976: 294; Gonzalez-Hernandez, 1995: 11.

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 (as *Hyperaspis limbatus* Casey): Swezey, 1925c: 374; Swezey, 1931c: 373; Chapman, 1938: 321; Beardsley, 1955: 385; Gonzalez-Hernandez, 1995: 11.

California 1906 (as *Hyperaspis limbalis* Casey): Beardsley, 1963: 195.

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 *Dactylopius*: Koebele, 1894: 103.

Pseudococcus brevipes: Chapman, 1938: 321.

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.

Hyperaspis japonica: Gonzalez-Hernandez, 1995: 11.

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.

Pseudococcus brevipes: Chapman, 1938: 320.

Collections: none.

Island distribution: none.

73. *Hyperaspis lateralis* Mulsant

Purposely introduced, not established.

Hyperaspis lateralis Mulsant, 1850: 657; Koebele, 1897b: 132; Koebele, 1898b: 265; Craw, 1907: 150; Koebele, 1907: 159; Swezey, 1925c: 373; Swezey, 1931c: 373; Chapman, 1938: 320; Lai *et al.*, 1986: 42; Gonzalez-Hernandez, 1995: 11; Nishida, 2002: 51; DoA.

Hyperaspis lateralis: Craw, 1907: 156; Perkins & Swezey, 1924: 27; Fullaway, 1952: 104; Dizon, 1964: 2.

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

California and Mexico 1896, 1902, 1906 (as *Hyperaspis lateralis* Mulsant): Swezey, 1925c: 373; Swezey, 1931c: 373; Chapman, 1938: 320.

California and Mexico 1896, 1902, 1906, 1946 (as *Hyperaspis lateralis* Mulsant): Lai *et al.*, 1986: 42.

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

California 1896 (as *Hyperaspis lateralis* Mulsant): Gonzalez-Hernandez, 1995: 11.

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.

Intended target pest: avocado mealybugs: Swezey, 1925c: 374.

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

Pseudococcus nipae: Chapman, 1938: 321.

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.

Origin: California 1894 (as *Hyperaspis osculans* LeConte): Koebele, 1894: 103.

Intended target pest: Lecanium and *Dactylopius*.

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.

Origin: California 1893 (as *Hyperaspis depressa* Casey): (misnomer) Swezey, 1925c: 373; Swezey, 1931c: 372; Chapman, 1938: 320; Lai *et al.*, 1986: 42; Gonzalez-Hernandez, 1995: 11; DoA.

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

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

Pseudococcus brevipes: Chapman, 1938: 320.

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.

Hyperaspis jocosa (Mulsant): (misidentified) Swezey, 1921: 521; Swezey, 1923b: 300; Swezey, 1925c: 370; Swezey, 1925d: 366; Swezey & Bryan, 1929: 298; Ehrhorn, 1936: 136; Pemberton & Williams, 1938: 217; Swezey, 1943b: 6; Krauss, 1944b: 86; Fullaway & Krauss, 1945: 76; Krauss, 1945: 314; Zimmerman, 1948c: 140; Leeper, 1976: 295; Mau, 1977c: 413; Suehiro, 1986: 37 & 50; Lai *et al.*, 1986: 42; Funasaki *et al.*, 1988: 116; Lai, 1988: 185; Leeper, 2014: 3.

Hyperaspis jocosa Mulsant: (misidentified) Kotinsky, 1909: 109.

Hypcraspis jocosa (Mulsant): (misidentified, misspelling) Swezey, 1931c: 369.

Hyperaspis jocosa: (misidentified) Ehrhorn, 1910c: 117; Ehrhorn, 1911a: 115; Ehrhorn, 1911b: 143; Ehrhorn, 1914b: 8; Fullaway, 1920: 240; Leeper, 1976: 295; Leeper, 2014: 3.

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 *Hypcraspis jocosa* (Mulsant)): (misidentified, misspelling) Swezey, 1931c: 369; Lai *et al.*, 1986: 42.

Mexico 1908 (as *Hyperaspis jocosa*): (misidentified) Fullaway, 1920: 240.

Mexico 1908 (as *Hyperaspis pantherina* Fursch): DoA.

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

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

Orthezia insignia Douglas: Swezey, 1925d: 366; Lai *et al.*, 1986: 42.

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

Collections: BM, DoA, UH.

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

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.

Pseudococcus brevipes: Chapman, 1938: 320.

Collections: none.

Island distribution: none.

79. *Hyperaspis silvestrii* Weise

Purposely introduced, established.

Hyperaspis silvestrii Weise, 1909: 205; Swezey, 1923b: 300; Fullaway, 1923b: 63; Fullaway, 1924a: 373; Swezey, 1925b: 47; Swezey, 1925c: 370; Timberlake, 1927: 548; Swezey, 1931c: 369; Swezey, 1927b: 355; Osborn, 1938: 153; Chapman, 1938: 320; Swezey, 1948: 204; Zimmerman, 1948c: 229; Pemberton, 1948: 74; Pemberton, 1964a: 705; Leeper, 1976: 295; Mau, 1977c: 413; Stein & Onaga, 1983: 180; Lai *et al.*, 1986: 43; Funasaki *et al.*, 1988: 116; Lai, 1988: 181; Gonzalez-Hernandez, 1995: 11; Nishida, 2002: 51; Hue *et al.*, 2007: 2; BMASC; DoA.

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

Hyperaspis sylvestrii Weise: (misspelling) Pandey, 2002: 26; Jahn *et al.*, 2003: 27.

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

Mexico 1922 (as *Hyperaspis sylvestrii* Weise): (misspelling) Pandey, 2002: 26.

No Origin 1922 (as *Hyperaspis silvestrii* Weise): Funasaki *et al.*, 1988: 116.

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.

Pseudococcus nipae (Maskell): Swezey, 1948: 204.

Pseudococcus brevipes: Chapman, 1938: 320.

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.

Red *Hyperaspis*: Swezey *et al.*, 1939: 350.
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.

Hyperaspis trilineata Mulsant, 1850: 667; Pemberton, 1964a: 702; Bianchi, 1964: 328; Pemberton, 1964b: 351; Davis & Krauss, 1964: 396; Beardsley, 1965b: 34; Lai *et al.*, 1986: 43; Nishida, 2002: 51; BMASC; DoA.
Origin: Barbados 1963 (as *Hyperaspis trilineata* Mulsant): Pemberton, 1964a: 702; Bianchi, 1964: 328; Pemberton, 1964b: 351; Davis & Krauss, 1964: 396; Lai *et al.*, 1986: 43; DoA.
Intended target pest: mealybugs.
Saccharicoccus sacchari (Cockerell): Lai *et al.*, 1986: 43; DoA.
Saccaricoccus sacchari (Cockerell) (Pink sugarcane mealybug): Davis & Krauss, 1964: 396.
pink and gray sugarcane mealybugs: Bianchi, 1964: 328.
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: Koebele, 1894: 103; Kotinsky, 1906c: 416; Swezey, 1925c: 373; Swezey, 1931c: 372; Chapman, 1938: 320; Lai *et al.*, 1986: 43; Gonzalez-Hernandez, 1995: 11; DoA.
Hyperaspis undulate 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: Swezey, 1925c: 373; Lai *et al.*, 1986: 43; DoA.
Lecanium and *Dactylopius*: Koebele, 1894: 103.
Pseudococcus brevipes: Chapman, 1938: 320.
Collections: none.
Island distribution: none.

84. *Illeis galbula* (Mulsant)

Purposely introduced, not established.

Illeis galbula (Mulsant, 1850: 166): Timberlake, 1943: 43

Halzia galbula (Mulsant): (misidentification, misspelling) Marsden, 1894: 31.
Origin: Australia 1894: Marsden, 1894: 31.
Intended target pest: mildew and Aphids: Marsden, 1894: 31.
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.

Intended target pest: plant lice: Swezey, 1923b: 301; Swezey, 1925c: 371.
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 tricolor var. *vitiensis*: Perkins, 1906d: 499.

Archaioneda tricolor fijiensis Crotch: Davis, 1961a: 325, Davis, 1961b: 391; Davis & Chong, 1968: 29; Lai *et al.*, 1986: 1; DoA.

Archaioneda fijiensis: Craw, 1907: 156.

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.

Fiji 1960 (as *Archaioneda tricolor fijiensis* Crotch): Davis, 1961a: 325; Davis, 1961b: 391.

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)

Purposely introduced, not established.

Menochilus sexmaculata (Fabricius, 1781: 96): Davis, 1972: 188; Nishida, 2002: 51.

Cheilomenes sexmaculatus: BMASC.

Chilomenes quadriplagiata (Swartz in Schonherr, 1808): Misspelling of synonym; Nishida, 2002: 50.

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 quartriplagiata* 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, Slipinski (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)

Purposely 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.

Intended target pest: plant lice: Swezey, 1923b: 301; Swezey, 1925c: 371.
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.

Coccinella arenata (Fabricius): (misspelling) Marsden, 1894: 31.

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.

Verania frenata: (misspelling) Kotinsky, 1905a: 153 & 156; Perkins, 1906c: 195; Kirkaldy, 1909a: 417.

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, 1905: 229.

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 lineata (Thunberg, 1781: 21): Nishida, 2002: 51; BMASC.

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

Alesia striata (Fabricius): DoA.

Alesia striata Fabricius: Davis, 1958:358; Davis & Chong, 1968: 28; Lai *et al.*, 1986: 2.

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

Kenya, Africa 1957 (as *Alesia striata* Fabricius): Davis, 1958:358.

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.

Discussion: Fursch (1987: 7) places *Micraspis striata* (Fabricius) (= *Coccinella striata* Fabricius) as a synonym of *Micraspis lineata* (Thunberg).

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: (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 Fabricius: Fullaway *et al.*, 1922: 27.

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

Verania strigula: Craw, 1906b: 151; Perkins, 1906a: xvii; Perkins, 1906c: 195; Perkins, 1906d: 499; Kirkaldy, 1909b: 56; 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.

Australia 1904 (as *Verania lineola* Fabricius): Timberlake, 1943: 27-28.

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 Randall: Koebele, 1894: 102.

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

Harmonia picta: BMASC.

Origin: California 1894 (as *Harmonia picta* Randall): Koebele, 1894: 102.

Intended target pest: plant lice: Koebele, 1894: 102.

Collections: none.

Island distribution: none.

97. *Nephaspis bicolor* Gordon

Purposely introduced, established.

Nephaspis bicolor Gordon, 1982: 335; Lai *et al.*, 1985: 83; Paulson & Kumashiro, 1985: 106; Lai *et al.*, 1986: 49; Funasaki *et al.*, 1988: 101; Nishida, 2002: 51; BMASC; DoA.

Nephaspis bicolor: Anonymous, 2006: 3; DoA

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

No Origin 1979 (as *Nephaspis bicolor* Gordon): Funasaki *et al.*, 1988: 117.

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 amnicola Wingo: Higa, 1982b: 18; Lai *et al.*, 1982: 110; Higa, 1983a: 168; Kumashiro *et al.*, 1983: 261; Paulson & Kumashiro, 1985: 106; Yoshida & Mau, 1985: 155; Lai *et al.*, 1986: 49; Funasaki *et al.*, 1988: 101; Funasaki *et al.*, 1988: 117; Lai, 1988: 180; 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.

Trinidad and Honduras 1979 (as *Nephaspis amnicola* Wingo): Lai *et al.*, 1986: 49; Higa, 1982b: 18.

No Origin 1979 (as *Nephaspis amnicola* Wingo): Funasaki *et al.*, 1988: 117.

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*

(Blatchley)) and synonymized *Nephaspis amnicola* Wingo with *Nephaspis oculata* (Blatchley) (= *Nephaspis oculata* (Blatchley)).

99. *Nephus roepkei* (Fluiter)

Purposely introduced, established.

Nephus roepkei (Fluiter, 1938: 49): Leeper, 1976: 296; Lai *et al.*, 1986: 49; Nishida, 2002: 52; BMASC.

Scymnus roepkei Fluiter: Beardsley, 1956: 18; Anonymous, 1956: 178; Tanada & Beardsley, 1958: 431; Davis, 1958, 64; Leeper, 1976: 297; DoA.

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

Scymnus bipunctatus: (misidentified) Ehrhorn, 1915a: 145; Fullaway, 1920: 240 & 241; Fullaway, 1923a: 319; Leeper, 1976: 296.

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

Scymnus bipunctatus (Klug): (misidentified) Jahn *et al.*, 2003: 27.

Scymnus near *bipunctatus*: Beardsley, 1956: 18.

Nephus bipunctatus Kugelann: Gonzalez-Hernandez, 1995: 11.

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

Nephus sp. near *bipunctatus* (Kugelann): Williams, 1931: 185, Swezey, 1931c: 369; Chapman, 1938: 320, 323 & 326; Leeper, 1976: 297.

Nephus sp. near *bipunctatus*: Swezey, 1935b: 97; Leeper, 1976: 297; Samuelson, 1998: 30.

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.

Japan 1895 (as *Nephus bipunctatus* Kugelann): Gonzalez-Hernandez, 1995: 11.

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 1938 (as *Nephus bipunctatus* Kugelann): Chapman, 1938: 326.

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.

Nephus sp.: Swezey, 1923: 300; Swezey, 1925c: 370; Swezey, 1931c: 369; Chapman, 1938: 320 & 321; Gonzalez-Hernandez, 1995: 11; Pandey, 2002: 26.

Origin: Mexico 1922 (as *Nephus* sp.): Swezey, 1923b: 300; Swezey, 1925c: 370; Swezey, 1931c: 369; Chapman, 1938: 320 & 321; Gonzalez-Hernandez, 1995: 11; Pandey, 2002: 26.

Intended target pest: *Pseudococcus bromeliae*: Swezey, 1923b: 300; Swezey, 1925c: 370.
Pseudococcus brevipes: Chapman, 1938: 320 & 321.

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 (Mulsant): Zimmerman, 1949: 341; Lai *et al.*, 1986: 66; Nishida, 2002: 52; BMASC; DoA.

Scymnus bineavatus: (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.

Intended target pest: mealybugs: Zimmerman 1949: 341; Lai *et al.*, 1986: 66; DoA.

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 abcominalis Say: (misspelling): Leeper, 1976: 297.

Coccinella abdominalis Mulsant: Krauss, 1944b: 86.

Coccinella abdominalis Say: Koebele, 1894: 102; Koebele, 1897a: 74; Koebele, 1897b: 115; Terry, 1904a: 299; Kotinsky, 1906c: 415; Kotinsky, 1906e: 118; Timberlake, 1943: 24.

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 occulata Fabricius: (misspelling) Koebele, 1898b: 265.

Cycloneda sayi Crotch: Timberlake, 1943: 24.

Harmonia v-nigrum Mulsant: Timberlake, 1943: 24.

Neda abdominalis: Perkins, 1903: 17; Perkins, 1904: 497; Kirkaldy, 1909b: 55; Perkins, 1913: cx; BMASC.

Olla abdominalis (Say): Timberlake, 1918: 401; Perkins, 1924: 216; Williams, 1931: 183; Zimmerman, 1948c: 87 271; Leeper & Beardsley, 1973: 8a; Leeper, 1975: 62; Leeper, 1976: 297; Leeper & Beardsley, 1976: 314; Paulson & Kumashiro, 1985: 106; Suehiro, 1986: 50; Lai *et al.*, 1986: 50; Funasaki *et al.*, 1988: 118; Asquith & Messing, 1992: 153; DoA.

Olla abdominalis Say: Takara *et al.*, 1990: 28-29.

Olla abdominalis: Fullaway, 1920: 241; BMASC.

Olla abdominalis var. *plagiata* Casey: Leeper, 1976: 298.

Olla abdominalis var. *plagiata* (Casey): Paulson & Kumashiro, 1985: 106.

Olla abdominalis subsp. *plagiata*: BMASC.

Olla abdominalis sobrina Casey: Zimmerman, 1948c: 68.

Olla plagiata Casey: Leeper, 1976: 298.

Orcus abdominalis: BMASC.

Origin: California 1894 (as *Olla abdominalis* Say): Koebele, 1894: 102.

Mexico 1900 (as *Olla abdominalis* Say): Lai *et al.*, 1986: 50.

Mexico 1908 (as *Olla abdominalis*): Fullaway, 1920: 241.

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.

Origin: Australia 1894 (*Orcus australasia*): Marsden, 1894: 32.

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.

Orcus bilunulatus: Kotinsky, 1905a: 154.

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.

Orcus cyanocephalus: Terry, 1904b: 476; Kotinsky, 1905a: 154.

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.

Orcus lafertei Mulsant, 1853: 190; Swezey, 1925c: 374; Swezey, 1931c: 373; Chapman, 1938: 321; Lai *et al.*, 1986: 55; Gonzalez-Hernandez, 1995: 11; Nishida, 2002: 52; BMASC; DoA.

Orcus lafertei: Kotinsky, 1905a: 154.

Origin: Australia 1904 (as *Orcus lafertei* Mulsant): Swezey, 1925c: 374; Swezey, 1931c: 373; Chapman, 1938: 321; Lai *et al.*, 1986: 55; Gonzalez-Hernandez, 1995: 11; DoA.

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

Pseudococcus nipae?: Swezey, 1925c: 374.

Pseudococcus brevipes: Chapman, 1938: 321.

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 (Mannerheim): Weber, 1953: 129; Lai *et al.*, 1986: 19; DoA.

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.

Intended target pest: aphids: Weber, 1953: 129; Lai *et al.*, 1986: 19.

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 Mulsant, 1850: 1036; Lai *et al.*, 1986: 57; Nishida, 2002: 52; DoA.

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 Mulsant, 1850: 502; Pemberton & Williams, 1938: 218; Lai *et al.*, 1986: 57; Nishida, 2002: 52; BMASC; DoA.

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.

Pentilia insidiosa Mulsant, 1850: 503; Weber, 1955: 635; Lai *et al.*, 1986: 58; Nishida, 2002: 52; BMASC; DoA.

Origin: Trinidad 1954 (as *Pentilia insidiosa* Mulsant): Weber, 1955: 635; Lai *et al.*, 1986: 58; DoA.

Intended target pest: scales (Coccidae & Diaspididae): Lai *et al.*, 1986: 58; DoA.
bamboo and other scales: Weber, 1955: 637.

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.

Pharoscymnus sp.: Beardsley, 1980: 179; Nishida, 2002: 52.

Origin: 1976: Beardsley, 1980: 179.

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. *Phrynocaria gratiosa* (Mulsant)

Purposely introduced, not established.

Phrynocaria gratiosa (Mulsant, 1853: 187): Timberlake, 1943: 35.

Coelophora gratiosa (Mulsant): Nishida, 2002: 50; BMASC.

Phrynocaria gratiosa: BMASC (as a synonym of *C. gratiosa*).

Origin: Australia 1897 (as *Phrynocaria 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 *Phrynocaria 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 subsp. *japonica* (Thunberg): (misspelling) Nishida, 2002: 52.

Propylea quatuordecimpunctata: (misspelling) BMASC.

Propylea 14-punctata japonica (Thunberg): Timberlake, 1943: 28.

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. *Pseudoazyza trinitatis* (Marshall)

Purposely introduced, not established.

Pseudoazyza trinitatis (Marshall, 1912: 320): Nishida, 2002: 52.

Azyza trinitatis Marshall: Weber, 1955: 635; Davis & Chong, 1968: 29; BMASC.

Azyza trinitatus Marshall: (misspelling) Lai *et al.*, 1986: 9; DoA.

Azyza trivittatus: (misspelling) Fullaway, 1952: 104.

Origin: Puerto Rico 1939 (as *Azyza trinitatus* Marshall): (misspelling) Lai *et al.*, 1986: 9; DoA.

Trinidad 1954 (as *Azyza trinitatis* Marshall): Weber, 1955: 635.

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

Bamboo and other scales: Weber, 1955: 635.

Collections: none.

Island distribution: Oahu, Maui.

115. *Psyllobora vigintimaculata* (Say)

Purposely introduced/Accidental introduction, established.

Psyllobora vigintimaculata (Say, 1824: 320): Leeper, 2014: 3.

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 taedata LeConte: (misspelling) Brenner, 2010: 22; Leeper, 2014: 4.

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

Origin: California 1894 (as *Psyllobora taedata* LeConte): Koebele, 1894: 102.

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

Intended target pest: *Oidium*: Swezey, 1925c: 374.

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.

Rhizobius caecus (Blackburn): (misspelling) Marsden, 1894: 32.

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.

Rhyzobius cyaneus Blackburn, 1889: 199: Correct spelling of genus.

Rhyzobius cyaneus (Blackburn): (misspelling) Marsden, 1894: 32.

Origin: Australia 1894 (as *Rhyzobius cyaneus* (Blackburn)): Marsden, 1894: 32.

Intended target pest: Eriococcus: 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.

Rhyzobius satelles (Blackburn): Marsden, 1894: 32.

Rhyzobius satelles Blackburn: Nishida, 2002: 52.

Origin: Australia 1894 (as *Rhyzobius satelles* (Blackburn)): Marsden, 1894: 32.

Intended target pest: Diaspidinae and *Chionaspis*: Marsden, 1894: 32.

Collections: none.

Island distribution: none.

Discussion: Although Slipinski (2007: 130) recognizes this species as *Rhyzobius satelles* Blackburn (1892b: 255), Nicolas (2011: 15) equates *Rhyzobius satelles* Blackburn with *Rhyzobius fagus* (Broun).

119. *Rhyzobius forestieri* (Mulsant)

Purposely introduced, established.

Rhyzobius forestieri (Mulsant, 1853: 286): Funasaki *et al.*, 1988: 119; Nishida, 2002: 52; BMASC, DoA.

Lindorus ventralis (Erichson): Timberlake, 1927: 532; Leeper & Beardsley, 1973: 8a; Leeper, 1976: 299; Suehiro, 1986: 50.

Lindorus [Rhyzobius] ventralis Erichson: Illingworth, 1929: 248.

Lindorus (Rhyzobius) ventralis Erichson: Illingworth, 1929: 249.

Lindorus sp.: Timberlake, 1923: 181; Zimmerman, 1948c: 229; Leeper, 1976: 299.

Rhizobium ventralis Erichson: (misspelling, misnomer) Gonzalez-Hernandez, 1995: 11.

Rhizobius ventralis (Erichson): (misspelling, misnomer) Ehrhorn *et al.*, 1913: 298; Swezey, 1925c: 370; Illingworth, 1928: 44; Rosa, 1933: 226; Swezey, 1935b: 97; Fullaway, 1947: 52; Zimmerman, 1948c: 75, 229; Beardsley & Tuthill, 1959: 59; Leeper, 1976: 299; Leeper & Beardsley, 1976: 314.

Rhizobius circularis Sharp: (misspelling, misnomer) Higa, 1982a: 12.

Rhizobius forestieri (Mulsant): (misspelling) Lai *et al.*, 1986: 64; Jahn *et al.*, 2003: 27.

Rhizobius ventralis Erichson: (misspelling, misnomer) Koebele, 1894: 104; Koebele, 1897a: 77; Koebele, 1897b: 119; Koebele, 1898a: 218; Compere, 1899: 261; Kotinsky, 1906c: 416; Kotinsky, 1906e: 118; Craw, 1907: 150; Silvestri, 1910: 305; Swezey, 1912: 158; Illingworth, 1923b: 279; Swezey, 1923b: 300; Swezey, 1925c: 370; Swezey, 1925d: 364; Perkins, 1925: 360; Chapman, 1938: 320; Swezey & Bryan, 1929: 298; Swezey, 1931c: 369; Swezey, 1943b: 5; Leeper, 1976: 299; Jahn *et al.*, 2003: 27.

Rhizobius ventralis (Gr.): (misspelling, misnomer) Marsden, 1894: 32.

Rhizobius ventralis: (misspelling, misnomer) Swezey, 1906a: 18; Craw, 1905b: 323; Kotinsky, 1907: 304; Giffard, 1908b: 181; Fullaway, 1909: 25; Kirkaldy, 1909 a: 411; Ehrhorn, 1911a: 115; Pemberton, 1915: 60; Fullaway, 1920: 241; Perkins, 1943: 2; Leeper, 1976: 299; Gagne, 1979: 72.

Rhyzobius ventralis Erichson: (misnomer) Illingworth, 1923b: 279.

Rhyzobius ventralis (Erichson): (misnomer) Leeper, 1975: 62; Higa, 1982a: 12.

Rhyzobius ventralis: Kotinsky, 1905a: 157; Kirkaldy, 1907a: 101; Timberlake, 1923: 181.

Rrizobius ventralis: (misspelling) Kotinsky, 1906c: 417.

Scymnus ventralis Erichson: Leeper, 1976: 299.

Origin: Australia via California 1894 (as *Rhizobius ventralis* Erichson): (misspelling, misnomer) Koebele, 1894: 104; Swezey, 1923b: 300; Swezey, 1925c: 370; Chapman, 1938: 320; Swezey, 1931c: 369.

Australia via California 1894 (as *Lindorus [Rhizobius ventralis]* Erichson): (misspelling, misnomer) Illingworth, 1929: 248.

Australia via California 1894 (as *Lindorus (Rhizobius) ventralis* Erichson): Illingworth, 1929: 249.

Australia 1894, California 1894 (as *Rhyzobius forestieri* (Mulsant)): Lai *et al.*, 1986: 64; DoA.

Australia 1894 (as *Rhizobium ventralis* Erichson): (misspelling, misnomer) Gonzalez-Hernandez, 1995: 11.

No Origin 1894 (as *Rhyzobius forestieri* (Mulsant)): Funasaki *et al.*, 1988: 119.

Intended target pest: mealybugs: Swezey, 1923b: 300; Swezey, 1925c: 370; Swezey, 1925d: 364; Lai *et al.*, 1986: 64; DoA.

Pseudococcus brevipes: Chapman, 1938: 320.

Collections: BM, DoA, UH.

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

Discussion: Pope (1981) and Gordon (1985: 32) explain the early confusion and misidentification of *Rhyzobius forestieri* as *Rhizobius ventralis*. *R. ventralis* was introduced into California first in 1888-1889 by Koebele but failed to become established. Koebele sent a second consignment, of what was thought to be *R. ventralis*, to California during his 1891-1892 trip. The second consignment became established in California and was the source of specimens sent to Hawaii in 1894. Pope (1981: 21) made the determination of the correct naming of the species established in California and Hawaii.

120. *Rhyzobius hirtellus* Crotch

Purposely introduced, not established.

Rhyzobius hirtellus Crotch, 1874: 298): Correct spellings of genus and author.

Rhizobius hirtellus (Grotch): Marsden, 1894: 32.

Origin: Australia 1894 (as *Rhizobius hirtellus* (Grotch)): Marsden, 1894: 32.

Intended target pest: Diaspidinae and *Chionaspis*: Marsden, 1894: 32.

Collections: none.

Island distribution: none.

121. *Rhyzobius lophanthae* (Blaisdell)

Purposely introduced, established.

Rhyzobius lophanthae (Blaisdell, 1892: 286): Nishida, 2002: 52; BMASC, DoA.

Lindorus lophanthae: Fullaway, 1919a: 2; Beardsley, 1970a: 480; Leeper, 1976: 295; BMASC.

Lindorus lophanthae: (misspelling): Fullaway, 1920: 244.

Lindorus lophanthae Blaisdell: Swezey, 1923b: 300; Swezey, 1925c: 370; Swezey, 1931c: 369;

Swezey & Williams, 1932: 184; Leeper & Beardsley, 1973: 8a; Lai *et al.*, 1986: 45; Lai, 1988: 183.

Lindorus lophanthae (Blaisdell): Timberlake, 1927: 532; Swezey, 1935b: 97; Swezey, 1939c: 189;

Sakimura *et al.*, 1940: 452; Swezey, 1952: 378; Beardsley, 1969: 279; Beardsley, 1970c: 508;

Leeper, 1976: 295; Leeper & Beardsley, 1976: 314; Stein & Onaga, 1983: 180; Funasaki *et al.*,

1988: 117; DoA.

Lindorus lophanthae (Boisduval): Davis, 1970: 523, Leeper, 1975: 62.

Lindorus lophanthae: Tenorio, 1969: 279.

Rhisobius lophantae: (misspelling) Kirkaldy, 1909a: 412; Silvestri, 1910: 308.

Rhizobius lophantha Blaisdell: (misspelling) Kotinsky, 1906c: 416.

Rhizobius lophanthae Blaisdell: Kotinsky, 1906e: 118.

Rhizobius toowoobae Blackburn: (misspelling) Kotinsky, 1906d: 30.

Rhizobius toowoobat Blackburn: (misspelling of genus and species) Koebele, 1894: 104.

Rhizobius towooba Blackburn: (misspelling) Kotinsky, 1905b: 268.

Scymnus lophanthae Blaisdell: Leeper, 1976: 295.

Origin: Australia via California (as *Rhizobius toowoobat* Blackburn): (misspelling of genus and species) Koebele, 1894: 104.

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.

Intended target pest: armored scales: Lai *et al.*, 1986: 45; DoA.

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

Aspidiotus, *Diaspis*, *Chionaspis*, etc. also, Lecanidinae: Koebele, 1894: 104.

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.

Rhizobius pulcher (Blackburn): Marsden, 1894: 32.

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.

Rhizobius speculifer (Blackburn): Marsden, 1894: 32.

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.

Rodolia cardinalis (Mulsant, 1850: 158): Swezey, 1935b: 97; Krauss, 1944b: 86; Krauss, 1945: 314; Zimmerman, 1948c: 136-137, 333; Pemberton, 1958: 335; Clagg, 1959: 28; Beardsley & Tuthill, 1959: 59; Beardsley, 1962: 23; Pemberton, 1964a: 699; Hale, 1970: 549; Leeper, 1975: 62; Leeper, 1976: 299; Leeper & Beardsley, 1976: 314; Suehiro, 1986: 50; Funasaki *et al.*, 1988: 110; Lai, 1988: 181; Nishida, 2002: 52; Starr *et al.*, 2006: 49; BMASC.

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 cardinalis: Kotinsky, 1909: 111; Kirkaldy, 1909a: 411; Silvestri, 1910: 304; Ehrhorn, 1911a: 115; Ehrhorn, 1911b: 143; Bryan, 1915: 393; Fullaway, 1920: 240; Swezey, 1923b: 299; Perkins, 1925: 359; Perkins, 1943: 2; Leeper, 1976: 299.

Novius: Silvestri, 1910: 301.

Rodolia cardinalis Mulsant: Holdaway & Look, 1942: 258; Leeper & Beardsley, 1973: 8a; Lai *et al.*, 1986: 64; Funasaki *et al.*, 1988: 119; Gonzalez-Hernandez, 1995: 111; DoA.

Rodolia cardinalis: Swezey, 1943a: 286.

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

Vedalia cardinalis Mulsant: Koebele, 1897a: 77; Koebele, 1897b: 119; Koebele, 1898a: 217; Compere, 1899: 261; Terry, 1904a: 301; Kotinsky, 1906c: 415; 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.

Vedalia: Ehrhorn, 1911d: 219.

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.

Intended target pest: cottony cushion scale (*Icerya purchasi*): Swezey, 1923b: 300.

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 koebeli: (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.

Origin: Australia 1890 (as *Novius koebelei* Blackburn): Lai *et al.*, 1986: 49.

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.

Australia, ? (as *Novius koebelei*): Swezey, 1931c: 369.

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

cottony cushion scale: Swezey, 1923b: 300; Lai *et al.*, 1986: 49.

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.

Sasajiscymnus anomalus (Chapin, 1965a: 210): Leeper, 2014: 4.

Pseudoscymnus anomalus Chapin: Davis, 1972: 188; Kawamura, 1974: 322; Davis, 1974: 354; Leeper, 1976: 298; Funasaki *et al.*, 1988: 119; Nishida, 2002: 52; Leeper, 2014: 4; BMASC; DoA.
Pseudoscymnus sp.: Tenorio, 1969:279.

Pseudoscymnus: Davis, 1971: 61; Lai *et al.*, 1986: 62; Leeper, 2014: 4.

Origin: Guam 1970 (as *Pseudoscymnus anomalus* Chapin): Kawamura, 1974: 322; DoA.

Guam 1970 (as *Pseudoscymnus*): Davis 1971: 61; Lai *et al.*, 1986: 62.

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

No Origin 1970 (as *Pseudoscymnus anomalus* Chapin): Funasaki *et al.*, 1988: 119.

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

Aspidiotus destructor: Kawamura, 1974: 322.

Collections: BM, UH.

Island distribution: Oahu.

129. *Scymnobi* *bilucernarius* (Mulsant)

Purposely introduced, established.

Scymnobi *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 bilucernarius (Mulsant): Swezey, 1935a: 32; Krauss, 1945: 314; Leeper, 1976: 296; Mau, 1977c: 413; Samuelson, 1998: 30; Nishida, 2002: 52; BMASC.

Nephus bilucernarius Mulsant: Swezey *et al.*, 1939: 350; Zimmerman, 1948c: 189; Leeper, 1976: 296; Lai *et al.*, 1986: 49; Funasaki *et al.*, 1988: 117; Gonzalez-Hernandez, 1995: 11 110; Pandey, 2002: 26; Jahn *et al.*, 2003: 27; Heu *et al.*, 2007: 2; DoA.

Nephus bilucernarius: Fullaway, 1952: 104.

Nephus pictus (Gorham): Swezey, 1934a: 389; Krauss, 1944b: 86; Nishida, 2002: 52; BMASC.

Nephus pictus Gorham: Chapman, 1938: 322 & 323.

Nephus (*Scymnus pictus*): Fullaway, 1925: 34.

Scymnus bilucernarius: Browne, 1939: 177; Leeper, 1976: 296; BMASC.

Scymnus bilucernarius (Mulsant): Swezey, 1939c: 189; Beardsley & Tuthill, 1959: 59; Stein & Onaga, 1983: 180.

Scymnus bilucernarius (Mulsant): (error, no caps) Leeper, 1976: 296.

Scymnus (*Nephus*) *bilucernarius* Mulsant: Leeper, 1976: 296.

Scymnus pictus Gorham: Swezey, 1931c: 373; Swezey, 1933: 218; Chock, 1933: 237; Swezey *et al.*, 1939: 350; Sakimura *et al.*, 1940: 452; Zimmerman, 1948c: 189; Lai *et al.*, 1986: 66; Gonzalez-Hernandez, 1995: 11; Pandey, 2002: 26; DoA.

(*Scymnus*) *pictus* Gorham: Chapman, 1938: 321.

Scymnus pictus: Fullaway, 1926: 48; Fullaway, 1927: 47; Fullaway, 1952: 104; BMASC.

Origin: Panama 1924; Mexico 1930.

Panama 1924 (as *Scymnus pictus* Gorham): Swezey, 1931c: 373; Lai *et al.*, 1986: 66; Gonzalez-Hernandez, 1995: 11; Pandey, 2002: 26; DoA.

Panama 1924 (as (*Scymnus*) *pictus* Gorham): Chapman, 1938: 321.

Mexico 1930 (as *Nephus bilucernarius* Mulsant): Swezey *et al.*, 1939: 350; Lai *et al.*, 1986: 49; Gonzalez-Hernandez, 1995: 11; Pandey, 2002: 26; DoA.

Mexico 1930 (as *Scymnus pictus* Gorham): Swezey, 1933: 218; Chock, 1933: 237; Swezey *et al.*, 1939: 350.

No Origin 1930 (as *Nephus bilucernarius* Mulsant): Funasaki *et al.*, 1988: 117.

Panama 1933 (as *Nephus pictus* Gorham): Chapman, 1938: 322.

Guatemala and Salvador 1933 (as *Nephus pictus* Gorham): Chapman, 1938: 323.

Intended target pest: pineapple mealybug: Swezey, 1933: 218; Chock, 1933: 237.

Pseudococcus brevipes: Chapman, 1938: 321 & 322.

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 *Scymnobi* to the status of a valid genus. They (Gordon & Gonzalez 2002: 63) then made *Scymnobi* *bilucernarius* (Mulsant) a new combination with synonyms *Scymnus bilucernarius* Mulsant and *Scymnus pictus* Gorham.

130. *Scymnobi* *galapagoensis* (Waterhouse)

Adventive introduction, established.

Scymnobioides 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.

Scymnus ocellatus Sharp: Koebele, 1897a: 75; Koebele, 1897b: 116; Koebele, 1898a: 215; Swezey, 1928b: 182; Illingworth, 1931: 380; Zimmerman, 1948c: 260; Swezey, 1954: 102; Leeper, 1976: 301; Suehiro, 1986: 37 & 50; Nishida, 2002: 52; BMASC.

Scymnus ocellatus: Fullaway, 1920: 240.

Origin: *Scymnobioides 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 *Scymnobioides 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. *Scymnobioides guttulatus* (LeConte)

Purposely introduced, not established.

Scymnobioides 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 guttulatus* LeConte): Koebele, 1894: 103.

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

Intended target pest: *Lecanium* and *Dactylopius*: Koebele, 1894: 103.

Collections: none

Island distribution: none

Discussion: Gordon (1976: 298) declared a new combination *Nephus (Scymnobioides) guttulatus* (LeConte) with *Scymnus guttulatus* LeConte a synonym. Then, Gordon & Gonzalez (2002: 59) raised *Scymnobioides* to the status of a valid genus.

132. *Scymnus (Pullus) dorcatomoides* Weise

Purposely introduced, established.

Scymnus (Pullus) dorcatomoides Weise, 1879: 151; Leeper, 1976: 301.

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

Scymnus dorcatomoides Weisse: (misspelling) Swezey, 1925a: 26.

Scymnus sp. near *dorcatomoides* Weise: Beardsley, 1957: 210; Leeper, 1976: 301.

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

Accidentally 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.

Origin: Accidental from western North America 1991 (as *Scymnus (Pullus) horni* Gorham): Kumashiro, 1993: 2.

Intended target pest: yellow sugarcane aphid, *Sipha flava* (Forbes) found on kikuyu grass: Kumashiro, 1993: 2.

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.

Scymnus (Pullus) loewii Mulsant, 1850: 890; Leeper, 1975: 62; Leeper, 1976: 301; Leeper & Beardsley, 1976: 314.

Pullus kinbergi Boheman: (misidentification) Leeper, 1976: 302.

Pullus kinbergi (Bogeman): (misidentification & misspelling) Leeper, 1976: 302.

Pullus kinbergi (Boheman): (misidentification) Williams, 1931: 183; Swezey & Williams, 1932: 184; Swezey, 1935b: 97; Swezey, 1937: 435; Sakimura *et al.*, 1940: 452; Krauss, 1945: 314; Leeper, 1976: 302.

Pullus kinbergi: (misidentification) BMASC.

Pullus loewii Mulsant: Holdaway & Look, 1942: 258; Leeper, 1976: 302.

Pullus loewii: BMASC.

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

Scymnus kinbergi: (misidentification) BMASC.

Scymnus loewii Mulsant: Leeper & Beardsley, 1973: 8a; Leeper, 1976: 302; Starr *et al.*, 2006: 50.

Scymnus loewii Mulsant (*vividus* Sharp): Zimmerman, 1948c: 87.

Scymnus loweii Mulsant: (misspelling) Leeper, 1976: 302.

Scymnus lowewii Mulsant: (misspelling) Leeper, 1976: 302.

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

Scymnus loewii: Gagne, 1979: 72.

Scymnus sp. near *dorcatomoides* Weise: Beardsley, 1957: 210; Leeper, 1976: 301.

Scymnus vividus Sharp: Koebele, 1897a: 75; Koebele, 1897b: 116; Koebele, 1898a: 215; Terry, 1904a: 301; Krauss, 1944b: 86; Zimmerman, 1948c: 87; Leeper, 1976: 302; Suehiro, 1986: 50.

Scymnus vividus: Perkins, 1903: 18; Perkins, 1904: 497; Kotinsky, 1905a: 157; Swezey, 1906a: 18; Giffard, 1908b: 183; Fullaway, 1909: 25; Kirkaldy, 1909b: 56; Fullaway, 1912: 10; Swezey, 1913a: 199; Leeper, 1976: 302; 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.

Intended target pest: *Dactylopius*: 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 (Pullus) subvillosus (Goeze, 1777: 247): Davis & Krauss, 1963: 248; Davis & Chong, 1968: 33.

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.

Aphids and Coccids: Davis & Krauss, 1963: 248.

Collections: none.

Island distribution: none.

139. *Scymnus (Pullus) suturalis* Thunberg

Purposely introduced, not established.

Scymnus (Pullus) suturalis Thunberg, 1795: 106; Higa, 1979: 26; Higa, 1980: 167; Lai *et al.*, 1986: 66; Nishida, 2002: 52; DoA.

Scymnus suturalis Thunberg: Nakao *et al.*, 1981: 429.

Origin: France 1976 (as *Scymnus (Pullus) suturalis* Thunberg): Higa, 1979: 26; Lai *et al.*, 1986: 66; DoA.

France 1976 (as *Scymnus suturalis* Thunberg): Nakao *et al.*, 1981: 429.

Intended target pest: *Pineus pini* (Macquart): Nakao *et al.*, 1981: 429; Lai *et al.*, 1986: 66; DoA.

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.

Scymnus (Pullus) uncinatus Sicard, 1924: 532; Krauss, 1945: 314; Zimmerman, 1948c: 189; Leeper, 1976: 302; Gonzalez-Hernandez, 1995: 11; Pandey, 2002: 26.

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 (Pullus) uncinatus Sicard: (misspelling) Swezey, 1945: 225; Editor, 1945: 461; Leeper, 1976: 302.

Scymnus (Pullus) uncinatus: Gonzalez-Hernandez, 1995: 11.

Scymnus uncinatus: (misspelling) BMASC.

Scymnus uncinatus Sicard: Zimmerman, 1948c: 250; Stein & Onaga, 1983: 180; Suehiro, 1986: 37 & 50; Lai *et al.*, 1986: 67; Funasaki *et al.*, 1988: 119; Nishida, 2002: 52; Jahn *et al.*, 2003: 27; BMASC; DoA.

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) uncinatus* Sicard): (misspelling) Swezey, 1945: 225-226; Gonzalez-Hernandez, 1995: 11.

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.

Intended target pest: *Pseudococcus brevipes*: Chapman, 1938: 321.

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.

Scymnus ambulans Blackburn, 1895: 252; Leeper, 2014: 4.

Scymnodes koebeli (Blackburn): Marsden, 1894: 32.

Scymnodes koebeli var. *varipes* Blackburn: Leeper, 1976: 301.

Scymnus varipes (Blackburn): Timberlake, 1923: 181; Leeper, 1976: 301; Nishida, 2002: 53; Leeper, 2014: 4.

Scymnus varipes Blackburn: Leeper, 2014: 4.

Scymnus varipes: Leeper, 1976:301; Gagne, 1979: 72.

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

Intended target pest: none.

Collections: UH.

Island distribution: Oahu, Hawaii.

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

142. *Scymnus apiciflavus* (Motschulsky)

Purposely introduced, not established.

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

Scymnus apiciflavus Motschulsky: Chapman, 1938: 326; Swezey *et al.*, 1939: 352; Lai *et al.*, 1986: 66; Gonzalez-Hernandez, 1995: 12; Nishida, 2002: 52; Pandey, 2002: 27; BMASC; DoA.

Pullus apiciflavus (Motschulsky): Swezey *et al.*, 1939: 350; Pemberton, 1964a: 702; BMASC.

Pullus apiciflavus: Fullaway, 1952: 104.

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

Malaysia 1931 (as *Pullus apiciflavus* (Motschulsky)): Swezey *et al.*, 1939: 350; Pemberton, 1964a: 702.

Malaysia 1938 (as *Scymnus apiciflavus* Motschulsky): Chapman, 1938: 326; Swezey *et al.*, 1939: 352; Gonzalez-Hernandez, 1995: 12; Pandey, 2002: 27.

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

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

Pseudococcus brevipes: Swezey *et al.*, 1939: 352.

Collections: none.

Island distribution: Oahu, Hawaii.

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

143. *Scymnus binotulatus* Boheman

Purposely introduced, not established.

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

Scymnus binotulatus (?): Swezey *et al.*, 1939: 350; Fullaway, 1952: 104.

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.

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.

Midus pygmaeus (Blackburn): (misspelling) Marsden, 1894: 32.

Midus pygmaeus Blackburn: Lai *et al.*, 1986: 48; Nishida, 2002: 51; BMASC; DoA.

Midus pygmaeus: Swezey *et al.*, 1939: 350; Fullaway, 1952: 104.

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.

 Aphids and Coccids: Davis & Krauss, 1963: 248.

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.

Diomus margipallens: Swezey, 1931c: 374; Fullaway, 1925: 34; Chapman, 1938: 321; Fullaway, 1952: 104; Gonzalez-Hernandez, 1995: 11; Pandey, 2002: 26.

Origin: Panama 1924 (as *Diomus margipallens* (Mulsant)): DoA.

 Panama 1924 (as *Diomus margipallens*): Swezey, 1931c: 374; Chapman, 1938: 321; Pandey, 2002: 26.

 Panama 1924 (as *Diomus margipallens* (Mulsant)): Lai et al., 1986: 31.

 Mexico 1930 (as *Diomus margipallens* (Mulsant)): Swezey, 1933: 218; Swezey et al., 1939: 350.

Intended target pest: pineapple mealybug: Swezey, 1933: 219.

Pseudococcus brevipes: Chapman, 1938: 321.

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.

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

Intended target pest: plant lice: Koebele, 1894: 103.

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.

Intended target pest: *Pseudococcus brevipes*: Chapman, 1938: 321.

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.

Intended target pest: mealybugs: Zimmerman, 1949: 341; Lai *et al.*, 1986: 67; DoA.

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.

Pseudococcus brevipes: Chapman, 1938: 320.

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.

Scymnus quadrivittatus (Mulsant): Zimmerman, 1949: 341.

Scymnus quadrivittatus: Fullaway, 1952: 104.

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

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

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

mealybugs: Zimmerman, 1949: 341.

Collections: none.

Island distribution: Oahu.

155. *Serangium maculigerum* Blackburn

Purposely introduced, established.

Serangium maculigerum Blackburn, 1892a: 73; Giffard, 1908a: 173; Swezey, 1923b: 300; Swezey, 1925c: 370; Swezey, 1925d: 364; Swezey, 1931c, p369; Swezey, 1939c: 189; Swezey, 1943b: 5; Mau, 1976b: 178; Leeper, 1976: 303; Paulson & Kumashiro, 1985: 106; Lai *et al.*, 1986: 68; Funasaki *et al.*, 1988: 120; Takumi, 1999: 31; Nishida, 2002: 53; BMASC; DoA.

Cryptognatha maculigerum: BMASC.

Cyrema nigellum: (misidentification/mis spelling of *Cyreme*) Fullaway, 1919b: 5.

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

Cyreme nigellum: (misidentification) Fullaway, 1920: 243; Leeper, 1976: 303.

Cyrenia nigellum (Blackburn): (misidentification/mis spelling of *Cyreme*) Marsden, 1894: 32; Fullaway, 1920: 243; Leeper, 1976: 303; BMASC.

Serangium maculiferum: (misspelling) Fullaway, 1919b: 5; Leeper, 1976: 303.

Serangium maculigerum: Giffard, 1908a: 173; Kirkaldy, 1909a: 412; Silvestri, 1910: 308; Fullaway, 1919b: 5; Leeper, 1976: 303.

Serangium maculegerum (Blackburn): (misspellings) Marsden, 1894: 33.

Origin: Australia 1894 (as *Cyreme 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.

Stethorus gilvifrons (Mulsant, 1850: 995): Nishida, 2002: 53; BMASC.

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: (misspelling) Anonymous, 1981: 340.

Stethorus loxtoni Britton: Nakao *et al.*, 1981: 429; Lai *et al.*, 1986: 69; DoA.

Stethorus loxtoni: BMASC.

Stethorus nigripes: Anonymous, 2006: 3; DoA

Origin: California 1978 (as *Stethorus loxtoni* Britton): Nakao *et al.*, 1981: 429; Lai *et al.*, 1986: 69; DoA .

Intended target pest: *Tetranychus cinnabarinus* (Boisduval): Nakao *et al.*, 1981: 429.

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 Casey: Weber, 1953: 129; Raros, 1971: 2; Nakao *et al.*, 1981: 429; Lai *et al.*, 1986: 69; DoA.

Stethorus picipes: Fullaway, 1952: 104; Anonymous, 2006: 3; BMASC; DoA.

Stethorus punctillum Weise: Raros, 1971: 2.

Stethorus punctum: BMASC.

Origin: California 1952 (as *Stethorus picipes* Casey): Weber, 1953: 129.

California 1952 and 1978 (as *Stethorus picipes* Casey): Lai *et al.*, 1986: 69; DoA.

Intended target pest: *Tetranychus cinnabarinus* (Boisduval): Nakao *et al.*, 1981: 429.

Tetranychus spp.: Lai *et al.*, 1986: 69; DoA.

Collections: none.

Island distribution: Oahu.

159. *Stethorus siphonulus* Kapur

Purposely introduced, established.

Stethorus siphonulus Kapur, 1948: 314; Raros & Haramoto, 1974: 457; Beardsley, 1975: 6; Leeper, 1976: 303; Lai *et al.*, 1986: 70; Funasaki *et al.*, 1988: 120; Nishida, 2002: 53; BMASC; DoA.

Scymnus vagans (Blackburn): Krauss, 1944b: 86; Leeper, 1976: 303.

Scymnus vagans Blackburn: Nishida, 2002: 53.

Scymnus vagans: Silvestri, 1910: 326.

Stethorus vagans Blackburn: (misidentified) Fullaway, 1922b: 80; Swezey, 1923b: 304; Swezey, 1927c: 355; Swezey, 1931c: 372; Williams, 1931: 185; Beardsley, 1975: 6; Leeper, 1976: 303.

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.

spider mites: Lai *et al.*, 1986: 70.

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.

Gymnoscymis quatromaculatus (Blackburn): (misspelling of both genus and species) Marsden, 1894: 32.

Origin: Australia 1894 (as *Gymnoscymis 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 ruficeps Weise, 1902: 511; Leeper, 1976: 304; Beardsley, 1980: 179; Lai *et al.*, 1986: 70; Funasaki *et al.*, 1988: 120; Gonzalez-Hernandez, 1995: 11; Nishida, 2002: 53; Jahn *et al.*, 2003: 27; BMASC; DoA.

Sticholotis punctata Crotch: Giffard, 1908a: 174; Illingworth, 1938b: 24; Haramoto, 1969: 47; Leeper, 1976: 304.

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.

Sticholotis punctatus: Fullaway, 1920: 243; Krauss, 1944b: 86; Zimmerman, 1948c: 283, 390; Leeper, 1976: 304; BMASC.

Origin: China and Japan 1895 (as *Sticholotis punctata* Crotch): Giffard, 1908a: 174; Leeper, 1976: 304.

China and Japan 1895 (as *Sticholotis punctatus*): Fullaway, 1920: 243.

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, Japan 1894-95 (as *Sticholotis ruficeps* Weise): Gonzalez-Hernandez, 1995: 11.

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, 1781: 12): Timberlake, 1943: 40.

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

Synonyche 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.

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

Synonche sp.: (misspelling) Craw, 1906a: 102.

Origin: China and Japan 1895 (as *Synonyche grandis* Thunberg, Disappeared after 1896): (misspelling) Swezey, 1923b: 301; Swezey, 1925c: 371; Swezey, 1931c: 370.

China and Japan 1895 (as *Synonyche grandis* Thunberg): (misspelling) Lai *et al.*, 1986: 70; DoA.

Okinawa 1958 (as *Synonyche grandis* Thunberg): (misspelling) Davis, 1959: 64.

Intended target pest: plant lice: Swezey, 1925c: 371.

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: Swezey, 1923b: 300; Swezey, 1925c: 370; Swezey, 1931c: 369; Zimmerman, 1948c: 418; Lai *et al.*, 1986: 58.

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

Pentilia nigra: Fullaway, 1920: 243.

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.

Intended target pest: Diaspine scales: Swezey, 1923b: 300; Swezey, 1925c: 370; Lai *et al.*, 1986: 58.

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.

Telsimia nitida Chapin, 1926: 130; Swezey, 1941: 11; Browne, 1942: 143; Pemberton, 1948: 79; Zimmerman, 1948c: 390; Swezey, 1951: 223; Swezey, 1952: 378; Swezey, 1954: 58; Zimmerman, 1957: 200; Beardsley, 1969: 279; Beardsley, 1970a: 480; Beardsley, 1970c: 508; Davis, 1970: 523; Leeper, 1976: 304; Mau, 1977c: 413; Lai *et al.*, 1986: 72; Funasaki *et al.*, 1988: 121; Lai, 1988: 183; Nishida, 2002: 53; Uchida *et al.*, 2003: 138; BMASC; DoA.

Cryptogonus nigripennis Weise: (misidentification) Swezey *et al.*, 1939: 350; Pemberton, 1940:363; Zimmerman, 1948c: 390; Leeper, 1976: 304.

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

Telsimia nitida: Tenorio, 1969:279.

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

Guam 1936 (as *Cryptogonus nigripennis* Weise): Swezey *et al.*, 1939: 350.

Guam 1936 (as *Telsimia nitida* Chapin): (misidentification) Pemberton, 1948: 79; Lai *et al.*, 1986: 72.

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

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

Intended target pest: *Pinnaspis buxi*: Swezey *et al.*, 1939: 350; Lai *et al.*, 1986: 72.

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 Sicard: Swezey, 1931c: 373; Nishida, 2002: 50; Chapman, 1938: 321; Lai *et al.*, 1986: 23; Gonzalez-Hernandez, 1995: 11; Pandey, 2002: 26; BMASC; DoA.

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

Origin: Panama 1924 (as *Cleothera bromelicola* Sicard): Swezey, 1931c: 373; Chapman, 1938: 321; Lai *et al.*, 1986: 23; Gonzalez-Hernandez, 1995: 11; Pandey, 2002: 26; DoA.

Intended target pest: *Pseudococcus brevipes*: Chapman, 1938: 321.

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.

Origin: Arizona 1902 (as *Thalassa montezumae* Mulsant): Koebele, 1907: 160.

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

Intended target pest: Lacaniid: Swezey, 1925c: 374.

Collections: BM, UH.

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

167. *Vibidia duodecimguttata* (Poda)

Purposely introduced, not established.

Vibidia duodecimguttata (Poda, 1761: 25): Nishida, 2002: 50; BMASC.

Vibidia duodecim-guttata (Poda): Timberlake, 1943: 41.

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

Intended target pest: mildew.

Collections: none.

Island distribution: none.

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