

## APPENDIX. Annotated list of all arthropod taxa collected.

The following list includes only taxa captured during the course of this inventory. We exclude species collected outside the study period or study area, as defined in the Methods. For each taxon record, we specify its native status (\* before the genus name indicates an introduced species, + indicates a species of unknown origin, while no symbol indicates an endemic species; a ? indicates that the generic determination is uncertain); we list the authority that made the determination (e.g., det. PDK); and we indicate whether it represents a new record for the park. While we did not undertake an exhaustive literature search, we believe these new records are valid based on the collections consulted and the literature examined. In cases where we found specimens previously collected at HALE in museum collections, we do not list those species as new records here even if we could find no published record of its prior collection (including cases where the species was not recorded from Maui in Nishida [2002]).

For all taxa collected through standardized methods, we also list the area(s) in which it was collected (lower or upper zone), its relative abundance, and the technique(s) with which it was captured (PF = pitfall traps, LE = litter extraction with Berlese funnel, VB = vegetation beating of focal shrub species [stytam = *Styphelia tameiameia*, sopchr = *Sophora chrysophylla*, vacret = *Vaccinium reticulatum*, dubmen = *Dubautia menziesii*]). For taxa captured through hand collecting only, we report the location of capture.

Relative abundance categories are rare (individuals captured < 5), uncommon (5 < individuals captured < 15), common (15 < individuals captured < 100), and abundant (100 < individuals captured). In addition, we list the collection methods in order of decreasing number of individuals captured for each species. Where multiple plant species are listed for vegetation beating, these are also listed in order of decreasing captures. When greater than approximately 90% of individuals were caught on a single plant species, suggesting host status, this plant (or in some cases combination of plants) is underlined. *It is important to note that these abundance designations are based exclusively on our captures in this study*; while our collection methods were quantitative, they may be biased against certain species. For example, species for which we did not sample the correct host plant, or which are more abundant at other times of year, or which are not efficiently captured with our sampling methods may all be more common than indicated from our results.

Current validity of taxonomic names and their authors follows those listed in the Integrated Taxonomic Information System (<http://www.itis.usda.gov/index.html>), Platnick (2006) or Nishida (2002). We provide synonyms only where names have changed recently, for example since Nishida (2002). Finally, authorities who made determinations are as follows: JB = J. Beatty, KC = K. Christiansen, GE = G. Edgecombe, NE = N. Evenhuis, CPE = C.P. Ewing, VF = V. Framenau, JG = J. Garb, RG = R. Gillespie, JH = J. Heinze, PDK = P. Krushelnycky, BK = B. Kumashiro, JKL = J.K. Liebherr, KM = K. Magnacca, SM = S. Marshall, JM = J. Miller, EM = E. Mockford, SN = S. Nakahara, DAP = D.A. Polhemus, DP = D. Pollock, ASR = A.S. Ramsdale, GAS = G.A. Samuelson, BS = B. Seifert, RS = R. Shelley, CT = C. Tauber, MT = M. Tremblay, PV = P. Vilkamaa and MZ = M. Zapparoli.

## PHYLUM ARTHROPODA

### CLASS ARACHNIDA

#### Order Acari (mites)

We collected over 10,200 individual Acari, belonging to many morphospecies. It was beyond the scope of our inventory to tackle this difficult taxonomic group, which probably contains many new species.

#### Order Araneae (spiders)

##### Family Agelenidae

\*Tegenaria domestica (Clerck, 1757) det. PDK  
 hand collecting; park service area, in laundry room and other buildings  
 This species has also been collected at Paliku cabin (Roth and Nishida 1997).

##### Family Araneidae

\*Gasteracantha mammosa L. Koch, 1844 det. PDK  
 hand collecting; park service area, from web on outside of building

##### Family Corinnidae

\*Meriola arcifera (Simon, 1886) det: JB  
 lower and upper zones; uncommon; PF  
 NEW HALE RECORD

##### Family Desidae

\*Badumna longinqua (L. Koch, 1867) det. PDK  
 hand collecting; west slope shrubland, on *Coprosma montana*; park service area, in laundry room  
 NEW HALE RECORD

## Family Dysderidae

- \*Dysdera crocata C.L. Koch, 1838 det. PDK  
lower and upper zones; common; PF

## Family Gnaphosidae

- \*Urozelotes rusticus (L. Koch, 1872) det. PDK  
lower zone; rare; PF  
This is the first record of this species for the west slope or crater district. The only prior HALE record is from lower Kipahulu Valley, near the coast. This spider is extremely abundant on Mauna Kea, and in the future could become an important introduced predator in HALE shrubland ecosystems.

## Family Linyphiidae

- +Centromerus sp. 1 det. JM  
lower zone; rare; PF  
NEW HALE RECORD  
This and the following two *Centromerus* species may be new endemic species.
- +Centromerus sp. 2 det. JM  
lower zone; rare; PF  
NEW HALE RECORD  
This species also occurs in the Kipuka Puu Huluhulu area of Hawaii Island. In addition, Bishop Museum holdings include unidentified specimens of this species from Poli Poli State Park, Maui, and from Hawaii Volcanoes National Park at Kipuka Ki, Mauna Loa.
- +Centromerus sp. 3 det. PDK  
upper zone; rare; PF  
Although not previously identified or reported in the state, Bishop Museum holdings include two specimens that appear to be this species, collected from HALE, “ridge E. of Kipahulu Valley, 6100 ft, sifting moss on tree trunks” by W.C. Gagne on June 24, 1981; and from Poamoho Trail, Koolau Mtns., Oahu.
- \*Eperigone fradeorum (Berland, 1932) det. JM  
upper zone; rare; PF  
NEW HALE RECORD
- \*Erigone autumnalis Emerton, 1882 det. JM  
lower and upper zones; uncommon; PF, LE  
NEW HALE RECORD
- \*Erigone dentosa O.P.-Cambridge, 1894 det. JM  
upper zone; rare; PF  
NEW HALE RECORD

- <sup>+</sup>?Meioneta sp. det. JM  
 lower zone; common; VB stytam  
 NEW HALE RECORD  
 The identity of this species is still unknown, and it differs from the *Meioneta* sp. of Gertsch (1973). It is possible that it is a new species related to the endemic cave species, *Meioneta gagnei* Gertsch. It is strongly impacted by the invasive Argentine ant, with no specimens collected within the boundaries of ant populations.
- \*Nesioneta lepida Millidge, 1991 det. PDK  
 upper zone; rare; PF  
 NEW HALE RECORD
- \*Ostearius melanopygius (Cambridge, 1880) det: JB  
 lower and upper zones; common; PF  
 NEW HALE RECORD  
 This cosmopolitan species (Platnick 2006) is incorrectly listed as endemic in the Hawaiian Terrestrial Arthropod Checklist (Nishida 2002).
- \*Tenuiphantes tenuis (Blackwall, 1852) det: JB  
 lower and upper zones; abundant; PF, VB stytam sopchr  
 NEW HALE RECORD
- <sup>+</sup>Linyphiidae sp. det. JM  
 lower and upper zones; uncommon; PF  
 Genus and species undetermined; this is probably a new state record. It appears to occur only where ants are absent.

#### Family Lycosidae

- Lycosa sp. det: VF  
 lower and upper zones; abundant; PF  
 This endemic species has typically been referred to as *Lycosa hawaiiensis*, but is apparently extremely similar to or the same as *Lycosa oahuensis* Keyserling. The entire group, however, is in need of revision and the taxonomy is likely to change (V. Framenau pers. comm.).

#### Family Miturgidae

- \*Cheiracanthium mordax L. Koch, 1866 det: PDK  
 lower zone; common; VB dubmen sopchr stytam vacret  
 This species is extremely abundant on certain parts of Mauna Kea at similar elevations, and could become an important introduced predator at HALE in the future.

## Family Oxyopidae

- <sup>+</sup>Oxyopes sp. det: PDK  
 Lower zone; rare; VB stytam  
 NEW HALE RECORD

## Family Philodromidae

- Pagiopalus atomarius Simon, 1900 det: PDK  
 lower and upper zones; common; VB stytam dubmen vacret sopchr, PF, LE

## Family Salticidae

- \*Habronattus tarsalis (Banks, 1904) det: JB  
 lower and upper zones; common; PF  
 NEW HALE RECORD  
 This common species may be an important introduced predator.

- Havaika sp. det: PDK  
 (= Sandalodes)  
 hand collecting; west slope shrubland, foraging on ground

## Family Tetragnathidae

- Tetragnatha quasimodo Gillespie, 1991 det: RG  
 hand collecting; park service area, on outside of building

- Tetragnatha sp. det: RG  
 hand collecting; west slope shrubland, adjacent to standing pool in gulch

## Family Theridiidae

- \*Achaeearanea acoreensis (Berland) det: JB  
 lower and upper zones; uncommon; PF  
 NEW HALE RECORD

- \*Achaeearanea cf. riparia (Blackwall, 1834) det: JB  
 (= Achaeearanea cf. saxatilis [C.L. Koch, 1834])  
 lower zone; abundant; VB stytam sopchr vacret dubmen, PF  
 NEW HALE RECORD  
 This species is common on Haleakala and extremely abundant on parts of Mauna Kea at similar elevations, and has been considered an invasive species (Gruner 2005). On the

other hand, its morphology suggests a Pacific faunal affinity, perhaps indicating that it could be native in Hawaii (M. Arnedo pers. comm.). Because it is a conspicuous species yet was not collected by Perkins (Simon 1900) or Suman (Suman 1964), was not reported in the state until 1999 (Beatty et al. 2000), and has no known related endemic species, we believe it is not native to Hawaii.

- \*Steatoda grossa (C.L. Koch, 1838) det. JB  
 lower and upper zones; abundant; PF  
 This large spider builds tangle webs beneath medium to large rocks, and may be an important introduced predator. It has been commonly collected in the park, but we could find no prior report of its presence in the literature.
- Theridion mauense Simon, 1900 det. PDK  
 lower zone; abundant; VB stytam, vacret, dubmen
- \*Theridion melanostictum Cambridge, 1876 det. PDK  
 lower zone; uncommon; VB stytam vacret, PF  
 NEW HALE RECORD

#### Family Thomisidae

- Misumenops kanakanus (Karsch, 1880) det. JG  
 lower zone; abundant; VB stytam sopchr dubmen vacret, PF, LE
- Misumenops sp. 1 det: JG  
 lower zone; rare; VB stytam  
 Only one immature specimen collected, but this species is likely to be *Misumenops anguliventris* (J. Garb pers. comm.).
- Misumenops sp. 2 det: JG  
 lower and upper zones; uncommon; PF, LE  
 Unlike the other *Misumenops* species, this undetermined species was captured exclusively on the ground.

## CLASS ENTOGNATHA

### Order Collembola (springtails)

#### Family Entomobryidae

- \*Entomobrya atrocincta Schott, 1896 det. PDK  
 lower and upper zones; abundant; PF, LE  
 This very abundant introduced species is extremely difficult to differentiate from the endemic *Entomobrya nyhusae*. Some of our specimens may therefore represent *E. nyhusae*, however the latter species has not yet been reported from Maui.
- Entomobrya kea Christiansen & Bellinger, 1992 det. KC  
 lower and upper zones; uncommon; PF  
 In addition to this species, our specimens may include the endemic *Entomobrya mauna*, which co-occurs with *E. kea* at high elevations and has been previously collected from upper Haleakala (Christiansen and Bellinger 1992).
- \*Entomobrya multifasciata (Tullberg, 1871) det. PDK  
 lower and upper zones; abundant; PF, LE  
 This distinctive species is the most ubiquitous and abundant springtail in the study area.
- <sup>+</sup>Entomobrya sp. det. KC  
 lower zone; uncommon; PF, LE  
 Only immature specimens collected, however this species is probably the introduced *Entomobrya guthriei* (K. Christiansen pers. comm.), which has been previously collected from HALE (Christiansen and Bellinger 1992).
- \*Pseudosinella octopunctata Börner, 1901 det. PDK  
 lower and upper zones; common; PF, LE  
 NEW HALE RECORD

#### Family Hypogastruridae

- Anurida anini Christiansen & Bellinger, 1992 det. KC  
 lower zone; rare; LE  
 NEW HALE RECORD
- \*Hypogastrura boletivora (Packard, 1873) det. PDK  
 lower zone; uncommon; PF  
 NEW HALE RECORD

\*Neanura muscorum (Templeton, 1835) det. PDK  
 lower zone; uncommon; LE, PF  
 NEW HALE RECORD

Xenylla auka Christiansen & Bellinger, 1992 det. PDK  
 lower and upper zones; abundant; LE, PF  
 NEW HALE RECORD  
 One of the most ubiquitous and abundant endemic springtails in the study area.

#### Family Isotomidae

Anurophorus lohi Christiansen & Bellinger, 1992 det. PDK  
 lower and upper zones; abundant; LE, PF  
 One of the most ubiquitous and abundant endemic springtails in the study area.

\*Cryptopygus benhami Christiansen & Bellinger, 1980 det. KC  
 lower zone; common; LE  
 NEW HALE RECORD

\*Cryptopygus thermophilus (Axelson, 1900) det. PDK  
 lower zone; uncommon; LE

\*Isotoma notabilis Schaffer, 1896 det. KC  
 lower zone; common; LE, PF  
 NEW HALE RECORD

#### Family Onychiuridae

\*Tullbergia macrochaeta (Rusek, 1976) det. PDK  
 lower zone; abundant; LE

### CLASS INSECTA

#### Order Archaeognatha

##### Family Machilidae

Neomachilis ?heteropus (Silvestri, 1904) det. PDK  
 upper zone; rare; PF  
 We captured only one female specimen from this rare group, making definitive species determination impossible (H. Sturm pers. comm.). *Neomachilis heteropus*, however, is

the only species currently known from Maui; Perkins reportedly collected this species at 5000 ft on Haleakala in 1896 (Sturm 1993).

## Order Coleoptera (beetles)

### Family Aglycyderidae

Proterhinus sp. det. PDK  
 upper zone; uncommon; VB dubmen  
 This endemic group is extremely speciose and difficult to identify. Our specimens may represent more than one species.

### Family Apionidae

\*Exapion ulicis (Forster, 1771) det. BK  
 lower zone; rare; VB sopchr, dubmen  
 We collected only two specimens of this intentionally introduced biocontrol agent, however it is presumably more abundant on its host plant, gorse (*Ulex europaeus*).

### Family Carabidae

Blackburnia frigida (Blackburn, 1878) det. JKL  
 upper zone; uncommon; PF

Blackburnia lenta (Sharp, 1903) det. JKL  
 lower and upper zones; common; PF  
 Prior to our survey, this species was collected only once in 1975 at Halemau'u trailhead in addition to the original 5 specimens collected by Perkins in 1894. While this species is now relatively common on the west slope and crater rim area of HALE, its distribution in this locality is quite restricted, placing it at direct risk from expanding populations of Argentine ants (Krushelnycky et al. 2005a). It has recently been found by PDK on Kalapawili ridge on the north rim of the crater, however, revealing another population that is beyond the immediate reach of Argentine ants.

Blackburnia rupicola (Blackburn, 1878) det. JKL  
 upper zone; uncommon; PF

Mecyclothorax apicalis Sharp, 1903 det. JKL  
 lower zone; rare; PF  
 This species has been collected only rarely in recent years.

- Mecyclothorax cordithorax Liebherr, 2005 det. JKL  
 lower and upper zones; common; PF, LE  
 Apparently rare in the study area in the late 19<sup>th</sup> and early 20<sup>th</sup> centuries (J. Liebherr pers.comm.), this species is now the most common native carabid on HALE's west slope.
- Mecyclothorax micans (Blackburn, 1878) det. JKL  
 upper zone; rare; PF  
 Although we captured only 1 individual, this species has been collected more commonly in recent decades.
- Mecyclothorax montivagus (Blackburn, 1878) det. JKL  
 lower and upper zones; rare; PF
- Mecyclothorax rusticus Sharp, 1903 det. JKL  
 upper zone; rare, PF  
 Prior to our single collection here, this species had not been seen since 1896 (Krushelnycky et al. 2005a).
- \*Trechus obtusus Erichson det. JKL  
 lower and upper zones; abundant; PF, LE  
 This recently introduced beetle was first detected in 1998 at Hosmer Grove and has since been spreading across the mountain to at least Poli Poli State Park (Leibherr and Takumi 2002). It has also recently been detected in Koolau Gap and on Hanakauhi Peak. It is already the most abundant carabid species in HALE's west slope shrubland, appears to be increasing in abundance in some areas, is not negatively affected by Argentine ants at this time, and consequently may place significant competitive pressure on native *Mecyclothorax* species (Liebherr and Krushelnycky 2007).

#### Family Cerambycidae

- Plagithmysus funebris Sharp, 1896 det. PDK  
 lower and upper zones; rare; PF  
 While we collected few specimens in our pitfall traps, this species is occasionally more common on its host plant, mamane (*Sophora chrysophylla*).
- Plagithmysus ?swezeyanus Gressitt & Davis, 1971 det. PDK  
 upper zone; rare; VB dubmen

#### Family Chrysomelidae

- \*Altica carinata (Germar, 1824) det. PDK  
 upper zone; rare; VB stytam  
 NEW HALE RECORD  
 This species appears to be a recent introduction to the state. One specimen in the Bishop

Museum was collected from fresh strawberries in an Oahu grocery. It is possible that this species feeds on Kula strawberries and was carried up to HALE on the winds.

- \*Lema trilineata Olivier det. PDK  
hand collecting; near summit, on *Dubautia menziesii*  
NEW HALE RECORD

#### Family Coccinellidae

- \*Coccinella septempunctata Linnaeus, 1758 det. PDK  
lower zone; rare; VB sopchr
- \*Diomus notescens (Blackburn, 1889) det. PDK  
lower and upper zones; uncommon; VB vacret, dubmen
- \*Diomus sp. det. PDK  
upper zone; uncommon; VB stytam  
NEW HALE RECORD  
The specific designation of this beetle remains undetermined in all state holdings examined.
- \*Hippodamia convergens Guerin-Meneville, 1844 det. PDK  
lower and upper zones; common; VB stytam sopchr vacret, PF
- \*Hyperaspis fimbriolata Melsheimer, 1847 det. PDK  
hand collecting; just inside crater rim, in leaf litter
- \*Olla v-nigrum Mulsant, 1866 det. PDK  
lower and upper zones; uncommon; VB dubmen sopchr
- \*Rhyzobius forestieri (Mulsant, 1853) det. PDK  
lower zone; rare; VB dubmen
- \*Rhyzobius lophanthae (Blaisdell, 1892) det. PDK  
lower zone; common; VB vacret stytam dubmen
- \*Scymnus loewii Mulsant, 1850 det. PDK  
lower zone; uncommon; VB stytam

#### Family Corylophidae

- <sup>+</sup>Sericoderus ?pubipennis Sharp, 1885 det. PDK  
lower zone; uncommon; PF

## Family Cryptophagidae

- \*?Cryptophagus sp. det. ASR  
 lower and upper zones; rare; PF  
 NEW HALE RECORD

## Family Curculionidae

- \*Listroderes costirostris Schonherr, 1826 det. PDK  
 (= Listroderes difficilis Germain, 1895)  
 lower zone; rare; PF  
 NEW HALE RECORD

- Oodemus sp. det. PDK  
 lower and upper zones; uncommon; PF, LE  
 This endemic genus contains many species, and differentiating them is difficult. Our specimens may represent several species.

- \*Pantomorus cervinus (Boheman, 1840) det. PDK  
 (= Asynonychus godmanni Crotch, 1867)  
 lower zone; uncommon; VB sopchr dubmen  
 This phytophagous species can become much more abundant in similar habitats, for example on Mauna Kea. It feeds on a wide variety of species, especially *Sophora chrysophylla* and *Chenopodium oahuense*.

- \*Tychius picirostris (Fabricius, 1787) clover seed weevil det. GAS  
 lower zone; rare; VB styam  
 NEW HALE RECORD

## Family Dermestidae

- \*Dermestes frischi Kugelann, 1792 det. GAS  
 upper zone; rare; PF

## Family Latridiidae

- \*Aridius nodifer (Westwood, 1839) det. GAS  
 lower and upper zones; uncommon; PF

## Family Mycetophagidae

- \*Litargus balteatus Le Conte, 1856 det. PDK  
lower and upper zones; rare; PF, VB stytam
- \*Typhaea stercorea (Linnaeus, 1758) det. PDK  
lower and upper zones; rare; PF

## Family Nitidulidae

- \*Carpophilus hemipterus (Linnaeus, 1758) driedfruit beetle det. CPE  
lower zone; uncommon; PF
- \*Carpophilus humeralis (Fabricius, 1798) det. CPE  
lower zone; uncommon; PF

## Family Scarabaeidae

- \*Onthophagus nigriventris D'Orbigny, 1905 det. PDK  
lower zone; rare; PF

## Family Staphylinidae

- \*?Atheta sp. 1 det. PDK  
lower zone; rare; PF
- \*?Atheta sp. 2 det. PDK  
lower zone; uncommon; PF
- <sup>+</sup>?Diestota sp. det. PDK  
lower zone; rare; PF
- \*Philonthus sp. nr. discoideus (Gravenhorst, 1802) det. ASR  
lower and upper zones; common; PF
- \*Tachyporus sp. det. ASR  
upper zone; rare; PF  
NEW HALE RECORD
- \*Hypocyphtini sp. det. PDK  
upper zone; rare; PF  
Genus and species undetermined.

**Order Dermaptera (earwigs)**

## Family Forficulidae

- \*Forficula auricularia Linnaeus, 1758 det. PDK  
lower and upper zones; common; PF

**Order Diptera (flies)**

## Family Agromyzidae

- <sup>+</sup>Phytoliriomyza montana Frick, 1953 det. PDK  
upper zone; rare; VB stytam  
Listed as endemic? in Nishida (2002).

## Family Anthomyiidae

- \*Delia platura (Meigen, 1826) seedcorn maggot det. PDK  
lower and upper zones; abundant; PF

## Family Calliphoridae

- Dyscritomyia grimshawi James, 1981 det. PDK  
upper zone; rare; PF

- \*Eucalliphora latifrons (Hough, 1899) det. PDK  
lower and upper zones; abundant; PF

- \*Pollenia rudis (Fabricius, 1794) det. PDK  
lower zone; rare; PF

## Family Cecidomyiidae

- Lestremia sp. det. PDK  
upper zone; rare; PF  
Only a single female collected.

- <sup>+</sup>Cecidomyiidae sp. det. PDK  
upper zone; uncommon; PF  
Genus and species undetermined. Only females collected.

## Family Chamaemyiidae

- \*Leucopis albipuncta Zetterstedt, 1855 det. PDK  
lower and upper zones; rare; VB dubmen, PF

## Family Chironomidae

- Orthocladius n. sp. det. KM  
upper zone; rare; PF  
NEW SPECIES  
This species keys to *O. grimshawi* Hardy in Hardy (1960), but recent examination of the genus *Orthocladius* indicates that many undescribed species exist, including this one (K. Magnacca pers. comm.).

## Family Dolichopodidae

- Campsicnemus macula Parent, 1940 det. PDK  
lower zone; rare; PF  
NEW HALE RECORD

- Campsicnemus mediofloccus Hardy & Kohn, 1964 det. PDK  
lower zone; uncommon; PF

- Campsicnemus n. sp. det. NE  
lower and upper zones; common; PF  
NEW SPECIES  
This new endemic species awaits description.

## Family Drosophilidae

- \*Drosophila sp. det. PDK  
lower zone; rare; PF  
A single female captured.

- Scaptomyza bryanti Hackman, 1959 det. PDK  
lower zone; rare; PF

- Scaptomyza cuspidata Hardy, 1965 det. PDK  
lower zone; rare; PF

Scaptomyza intricata Hardy, 1965 det. PDK  
 lower zone; rare; PF  
 NEW HALE RECORD

Family Heleomyzidae

\*Tephrochlamys sp. det. PDK  
 lower zone; rare; PF  
 NEW HALE RECORD

Family Mycetophilidae

<sup>+</sup>Leia sp. det. NE  
 lower zone; rare; PF  
 NEW HALE RECORD

Family Phoridae

Megaselia sp. det. PDK  
 lower and upper zones; common; PF

Family Sarcophagidae

\*Blaesoxipha plinthopyga (Wiedemann, 1830) det. PDK  
 lower and upper zones; common; PF

\*Helicobia morionella (Aldrich, 1930) det. PDK  
 lower zone; rare; PF

\*Ravinia anxia (Walker, 1849) det. PDK  
 lower and upper zones; uncommon; PF

Family Scatopsidae

\*Coboldia fuscipes (Meigen, 1830) det. PDK  
 upper zone; rare; PF  
 NEW HALE RECORD

## Family Sciaridae

- \*Bradysia sp. nr. impatiens (Johannsen, 1912) det. PV  
 lower and upper zones; uncommon; PF, VB stytam  
 NEW HALE RECORD
- Bradysia molokaiensis (Grimshaw, 1901) det. PV  
 upper zone; uncommon; PF  
 NEW HALE RECORD
- Bradysia setigera (Hardy, 1960) det. PV  
 upper zone; rare; PF
- \*Bradysia tritici (Coquillet, 1895) det. PDK  
 upper zone; rare; PF
- +Corynoptera n. sp. det. PV  
 lower and upper zones; common; PF  
 NEW SPECIES  
 According to P. Vilkamaa, this represents a new species.
- Ctenosciara hawaiiensis (Hardy, 1956) det. PV  
 upper zone; rare; PF
- Hyperlasion magnisensoria (Hardy, 1956) det. PDK  
 lower zone; rare; PF  
 NEW HALE RECORD
- +Sciaridae sp. det. PDK  
 lower zone; rare; PF  
 One wingless female specimen of undetermined genus and species was collected.

## Family Sepsidae

- \*Sepsis thoracica (Robineau-Desvoidy, 1830) det. PDK  
 upper zone; rare; PF, VB stytam

## Family Sphaeroceridae

- Trachyopella hardyi (Tenorio, 1968) det. SM  
 lower zone; rare; PF  
 NEW HALE RECORD

## Family Syrphidae

We captured only immature syrphids, which are common introduced predators of Hemiptera on various shrubs.

## Family Tachinidae

\*Chaetogaedia monticola (Bigot, 1887) det. PDK  
lower zone; rare; PF

\*Gonia longipulvilli Tothill, 1924 det. PDK  
upper zone; rare; PF

## Family Tephritidae

Trupanea cratericola (Grimshaw, 1901) det. PDK  
upper zone; rare; PF

Trupanea limpidapex (Grimshaw, 1901) det. PDK  
upper zone; rare; PF

## Family Tipulidae

Limonia hawaiiensis (Grimshaw, 1901) det. PDK  
upper zone; rare; PF

Limonia stygipennis (Alexander, 1919) det. PDK  
lower zone; rare; PF

**Order Hemiptera**

## Family Alydidae

\*Alydus pilosus Herrich-Schaeffer, 1848 det. DAP  
hand collecting; west slope shrubland, park service area; adult on *Sophora chrysophylla*,  
immature in grass  
NEW HALE RECORD  
Immatures of this species are ant mimics.

## Family Anthocoridae

- \*Alofa sodalis (White, 1878) det. PDK  
lower zone; rare; PF

## Family Aphididae

- \*Aulacorthum solani (Kaltenbach, 1843) det. MT  
lower zone; rare; VB dubmen
- \*Brachycaudus helichrysi (Kaltenbach, 1843) det. MT  
lower and upper zones; common; PF, VB dubmen
- \*Ericaphis fimbriata (Richards) blueberry aphid det. MT  
lower and upper zones; abundant; VB vacret stytam dubmen sopchr, PF  
Although this aphid has not been previously reported for the state, it has been previously collected on Maui (M. Tremblay pers. comm.). It is now very abundant on *Vaccinium reticulatum*, especially in areas invaded by the Argentine ant.
- \*Illinoia azaleae (Mason, 1925) det. MT  
lower and upper zones; abundant; VB vacret stytam dubmen sopchr, PF  
This aphid is the second most abundant species on *Vaccinium reticulatum*, and is also more abundant in ant-invaded areas. It has been present for at least 30 years.
- \*Macrosiphum euphorbiae (Thomas, 1878) det. MT  
lower zone; common; PF, VB dubmen sopchr stytam
- \*Sitobion fragariae (Walker, 1848) det. MT  
lower and upper zones; common; PF, VB dubmen sopchr vacret stytam  
Although this aphid has not been previously reported for the state, it has been previously collected on Maui (M. Tremblay pers. comm.).

## Family Cercopidae

- \*Clastoptera xanthocephala Germar, 1839 det. PDK  
lower and upper zones; uncommon; VB dubmen sopchr

## Family Cicadellidae

- \*Graminella sonora (Ball, 1900) det. PDK  
lower zone; rare; PF

- Nesophrosyne haleakala Kirkaldy, 1910 det. PDK  
lower and upper zones; uncommon; VB sopchr dubmen, PF
- \*Planiocephalus flavicosta (Stal, 1862) det. PDK  
upper zone; rare; PF  
NEW HALE RECORD
- \*Cicadellidae sp. det. DAP  
lower zone; rare; PF  
Genus and species undetermined.

#### Family Delphacidae

- Emoloana sporobolicola (Kirkaldy, 1910) det. PDK  
lower zone; rare; PF  
As this species is a grass feeder, it was not targeted by our sampling methods and is likely more common than our results indicate.
- Nesosydne osborni (Muir, 1916) det. PDK  
lower and upper zones; abundant; VB dubmen sopchr, PF, LE  
This species is extremely similar to *Nesosydne bridwelli* Muir 1919, and differs only in the shape of the aedeagus. Zimmerman (1948) stated that the two forms may represent variation within a single species. We collected both forms, as well as individuals with intermediate morphology. Because of this non-discrete variation, we refer to them only as *N. osborni* here, the species with priority.
- Nesosydne nigrinervis (Muir, 1919) det. PDK  
lower and upper zones; abundant; VB stytam vacret dubmen, PF, LE
- Nesosydne raillardiicola (Muir, 1919) det. PDK  
lower and upper zones; abundant; VB dubmen sopchr vacret stytam

#### Family Lygaeidae

- \*Geocoris pallens Stal, 1854 det. PDK  
upper zone; common; PF, VB stytam
- \*Graptostethus manillensis (Stal, 1859) det. PDK  
upper zone; rare; PF
- Nesius ochriasis baldwini Usinger, 1945 det. PDK  
lower zone; uncommon; VB sopchr

- Nysius abnormis Usinger, 1942 det. DAP  
lower zone; uncommon; LE, VB stytam
- Nysius beardsleyi Ashlock, 1966 det. DAP  
lower zone; rare; VB sopchr vacret, PF, LE
- Nysius coenosulus Stal, 1859 det. DAP  
upper zone; rare; VB stytam
- Nysius communis Usinger, 1942 det. DAP  
lower and upper zones; common; VB dubmen sopchr stytam vacret
- Nysius kinbergi Usinger, 1959 det. DAP  
lower and upper zones; uncommon; VB stytam sopchr vacret dubmen
- Nysius lichenicola Kirkaldy, 1910 det. DAP  
lower and upper zones; common; PF, VB stytam dubmen
- \*Nysius palor Ashlock, 1963 det. DAP  
upper zone; rare; VB stytam, PF  
This introduced *Nysius* was first seen in the Northwest Hawaiian Islands and has recently spread to the main islands (D. Polhemus pers. comm.). Although it currently appears to be rare at HALE, it is extremely abundant in similar habitats and elevations on Mauna Kea. It may become more common at HALE in the future, competing with native *Nysius*.
- Nysius rubescens White, 1881 det. DAP  
lower; uncommon; VB vacret, PF
- Nysius terrestris Usinger, 1942 det. DAP  
lower and upper zones; uncommon; VB stytam vacret, LE

#### Family Margarodidae

- \*Icerya purchasi Maskell, 1878 cottony cushion scale det. PDK  
hand collecting; west slope shrubland, on *Sophora chrysophylla*

#### Family Miridae

- Engytatus hawaiiensis (Kirkaldy, 1902) det. PDK  
lower and upper zones; abundant; VB dubmen, vacret
- \*Hyalopeplus pellucidus (Stal, 1859) det. PDK  
hand collecting; west slope shrubland, on ground

- Opuna n. sp. 1 det. DAP  
 lower and upper zones; abundant; VB stytam, sopchr, PF  
 NEW SPECIES  
 Many species of endemic *Opuna* remain to be described from dryland habitats, including this and the following three from HALE (D. Polhemus pers. comm.).
- Opuna n. sp. 2 det. DAP  
 lower zone; uncommon; VB sopchr  
 NEW SPECIES
- Opuna n. sp. 3 det. DAP  
 lower zone; rare; VB sopchr  
 NEW SPECIES  
 The host for this undescribed species is *Santalum haleakalae* (D. Polhemus pers. comm.).
- Opuna n. sp. 4 det. DAP  
 lower zone; rare; VB sopchr  
 NEW SPECIES
- Orthotylus coprosmophila Polhemus, 2005 det. DAP  
 hand collecting; west slope shrubland, on *Sophora chrysophylla*
- Orthotylus sophoroides Polhemus, 2005 det. DAP  
 lower and upper zones; abundant; VB sopchr vacret dubmen
- Sarona haleakala Asquith, 1994 det. PDK  
 lower zone; uncommon; VB dubmen

## Family Nabidae

- \*Nabis capsiformis Germar, 1837 det. DAP  
 hand collecting; just inside crater rim, on ground
- Nabis n. sp. (= "haleakala" Polhemus in manuscript) det. DAP  
 upper zone; rare; VB stytam, PF  
 NEW SPECIES
- Nabis n. sp. (= "siban" Polhemus in manuscript) det. DAP  
 lower zone; rare; VB stytam  
 NEW SPECIES

## Family Pentatomidae

Oechalia pacifica (Stal, 1859) det. PDK  
hand collecting; west slope shrubland, on *Dubautia menziesii*

## Family Pseudococcidae

Numerous pseudococcids were collected, especially on *Styphelia tameiameia*, in pitfalls and from litter samples, but these were not identified beyond the level of family.

## Family Psyllidae

\*Acizzia uncatoides (Ferris & Kylvær, 1932) koa psyllid det. PDK  
lower and upper zones; common; VB styam dubmen sopchr, PF

\*Glycaspis brimblecombei Moore det. PDK  
lower zone; rare; VB sopchr  
NEW HALE RECORD  
This Australian psyllid feeds on Eucalyptus and was first recorded in the state in 2001.

## Family Reduviidae

\*Empicoris rubromaculatus (Blackburn, 1888) det. PDK  
lower zone; rare; PF

## Family Rhyparochromidae

\*Brentiscerus australis (Bergroth, 1916) det. DAP  
lower and upper zones; uncommon; PF

## Family Tingidae

\*Corythuca morrilli Osborn & Drake, 1917 det. PDK  
lower zone; rare; VB sopchr  
NEW HALE RECORD

## Order Hymenoptera (ants, wasps, bees)

### Family Apidae

- \*Apis mellifera Linnaeus, 1758                      honey bee                      det. PDK  
 upper zone; rare; PF  
 Although we captured only one individual, honey bees are relatively common in HALE.

### Family Colletidae

- Hylaeus nivicola Meade-Waldo, 1923                      det. KM  
 upper zone; uncommon; PF  
 Our sampling techniques did not target this and other *Hylaeus* species; this species is relatively common.

- Hylaeus volatilis (F. Smith, 1879)                      det. KM  
 upper zone; rare; PF

### Family Formicidae

- \*Cardiocondyla kagutsuchi Terayama, 1999                      det. BS & JH  
 hand collecting; west slope shrubland, various locations, from nests under rocks  
 This species was previously misidentified as the very similar *Cardiocondyla venustula* Wheeler. Both species occur in Hawaii, but so far all specimens from HALE have been identified as *C. kagutsuchi* (B. Seifert pers. comm. and P. Krushelnycky unpubl. data).

- \*Hypoponera opaciceps (Mayr, 1887)                      det. PDK  
 lower and upper zones; uncommon; PF  
 This species is widespread in the park, but forms small colonies and occurs in low numbers.

- \*Linepithema humile (Mayr, 1868)                      Argentine ant                      det. PDK  
 lower and upper zones; abundant; PF, VB vacret dubmen stytam sopchr, LE  
 Without question, the single greatest current threat to a variety of endemic arthropod species on upper Haleakala. This species was first reported from HALE in 1967, and has since spread to occupy over 600 ha of the park and adjacent Haleakala ranch. Its history of expansion strongly suggests that it will spread to the majority of the west slope and crater areas of the park, potentially infesting the entire ranges of some highly localized endemic species (Krushelnycky et al. 2005b).

- \*Strumigenys rogeri Emery, 1890                      det. PDK  
 lower zone; rare; PF  
 NEW HALE RECORD?

Only a single specimen of this distinctive species was collected during this survey, and it has not been detected before or since during much extensive fieldwork related to the Argentine ant on the west slope of HALE. This species typically lives at lower elevations. It is possible (but fairly unlikely) that the specimen in question arrived via sample contamination, or (more likely) that a small colony existed ephemerally. The collection locality should be searched more exhaustively for more individuals.

#### Family Ichneumonidae

\*Spilichneumon superbus (Provancher, 1886) det. PDK  
upper zone; uncommon; PF

#### Family Pompilidae

\*Anoplius toluca (Cameron, 1893) det. PDK  
lower and upper zones; common; PF  
This predator of spiders may be exerting substantial pressure on *Lycosa* and other native spiders.

#### Family Vespidae

Odynerus nubicola Perkins, 1899 det. PDK  
upper zone; rare; PF  
Our sampling techniques did not target this and other *Odynerus* species; this species is relatively common.

Odynerus sociabilis Perkins, 1899 det. PDK  
upper zone; uncommon; PF  
This species very similar to *O. molokaiensis*; our specimens may be *O. molokaiensis*.

\*Vespula pensylvanica (Saussure, 1857) western yellowjacket det. PDK  
lower zone; rare; PF  
Although less abundant than in the past, this species is not rare – our sampling techniques did not target yellowjackets. *Vespula* are predators of a wide variety of arthropods (Gambino 1992), and are likely exerting substantial impacts on native species.

#### Parasitic Hymenoptera

We collected many additional species of micro-Hymenoptera, most of which are probably parasitoids, but these were not sorted below the level of order.

## Order Lepidoptera (moths, butterflies and skimmers)

As we did not employ light traps as a sampling technique, all Lepidoptera in our survey were captured through ineffective methods (except for immatures of some species, as well as the ground active *Thyrocopa apatela*). Our abundance designations are therefore likely to be inaccurate. Moreover, since most were captured in pitfall traps, the specimens were badly damaged and difficult to identify to species.

### Family Carposinidae

Carposina sp. det. DP  
lower zone; uncommon; PF

### Family Cosmopterigidae

Hyposmocoma sp. 1 det. PDK  
lower zone; uncommon; PF, LE  
This taxon identified from the immature, case-making caterpillars. It may correspond to one of the adult taxa listed below.

Hyposmocoma sp. 2 det. DP  
lower and upper zones; common; PF, VB styam

Hyposmocoma sp. 3 det. DP  
lower zone; rare; PF

Hyposmocoma sp. 4 det. DP  
lower and upper zones; rare; PF

### Family Crambidae

Eudonia sp. det. DP  
upper zone; common; PF

?Mestolobes sp. det. DP  
lower zone; common; PF, VB styam

?Orthomecyna sp. det. DP  
lower and upper zones; common; PF

Uresiphita polygonalis virescens (Butler, 1881) det. PDK  
lower zone; rare; VB sopchr  
We collected only 2 caterpillars of this species, however it can be much more common on

*Sophora chrysophylla* at the peak of its season.

Family Lycaenidae

\*Lampides boeticus (Linnaeus, 1767)      bean butterfly      det. PDK  
 upper zone; rare; PF

Family Noctuidae

Agrotis sp.      det. DP  
 lower zone; rare; PF  
 Although only one adult *Agrotis* was captured, immature noctuids were more common in pitfall traps, particularly in the upper zone. These caterpillars are most likely endemic *Agrotis* species.

\*Pseudaletia unipuncta (Haworth, 1809)      det. DP  
 lower zone; rare; PF

Family Oecophoridae

Thyrocopa apatela (Walsingham, 1907)      det. PDK  
 lower and upper zones; common; PF  
 This flightless species has a distribution limited to the top of Haleakala. It has reduced wings and hops around the cinders and shrubland of the alpine and subalpine zones. It is very sensitive to Argentine ants, with nearly all individuals captured outside the boundaries of the ant populations.

Thyrocopa sp.      det. DP  
 lower zone; rare; PF

Family Pterophoridae

\*Pterophoridae sp.      det. DP  
 lower and upper zones; rare; PF  
 Members of this group of introduced species are common in the shrubland and are active by day.

## Order Neuroptera (lacewings, antlions)

### Family Hemerobiidae

- \*Hemerobius pacificus Banks, 1897 det. CT  
lower and upper zones; common; PF, VB stytam vacret dubmen
- Micromus haleakalae (Perkins, 1899) det. CT  
lower zone; rare; VB stytam
- Micromus minimus (Perkins, 1899) det. CT  
lower zone; rare; VB stytam dubmen  
NEW HALE RECORD
- Micromus vagus (Perkins, 1899) det. CT  
lower zone; rare; VB vacret  
Despite our few captures, this is one of the more commonly collected endemic *Micromus* species.
- \*Symphorobius barberi (Banks, 1903) det. CT  
lower and upper zones; uncommon; VB stytam, PF

## Order Psocoptera (psocids, barklice and booklice)

### Family Ectopsocidae

- \*Ectopsocus californicus (Banks, 1903) det. EM  
lower and upper zones; abundant; VB stytam vacret sopchr dubmen, PF, LE  
NEW HALE RECORD
- \*Ectopsocus vachoni Badonnel, 1945 det. EM  
lower and upper zones; abundant; LE, PF, VB stytam  
NEW HALE RECORD  
Extremely abundant in leaf litter.

### Family Elipsocidae

- \*Elipsocus hyalinus (Stephens, 1836) det. EM  
lower zone; uncommon; VB sopchr dubmen vacret  
NEW HALE RECORD

Kilauella spp.

det. EM

lower zone; abundant; VB stytam vacret dubmen sopchr

Four morphospecies were recognized and designated from our collections by E. Mockford, one of which is particularly abundant on *Styphelia tameiameia*. Until this diverse and nearly untouched endemic genus is further studied, we refrain from referring to these taxa as new species. There can be little doubt, however, that many new species of *Kilauella* await description (Thornton 1990), including forms from HALE.

\*Propocus pulchripennis (Perkins, 1899)

det. EM

lower and upper zones; uncommon; PF, VB stytam

## Family Lachesillidae

\*Lachesilla tectorum Badonnel, 1931

det. EM

lower and upper zones; uncommon; VB sopchr dubmen stytam  
NEW HALE RECORD

## Family Liposcelidae

\*Liposcelis bostrychophila Badonnel, 1931

det. EM

lower and upper zones; common; LE, PF  
NEW HALE RECORD

This cosmopolitan species also occurs near Ahumoa crater and Mauna Kea State Park on Hawaii Island.

+Liposcelis n. sp. (= "kipukae" Mockford and Krushelnycky in prep) det. EM

lower zone; uncommon; LE, PF  
NEW SPECIES

This species appears likely to be endemic, but further study of the Hawaiian fauna in this genus is desirable. This species also occurs near Mauna Kea State Park and in the Kipuka Puu Huluhulu area on Hawaii Island.

## Family Philotarsidae

\*Haplophallus talilus? Thornton & New

det. EM

lower zone; rare; VB dubmen  
NEW HALE RECORD

This is the first record of this family and genus in the state.

## Family Psocidae

- Ptycta distinguenda (Perkins, 1899) det. EM  
lower zone; rare; VB sopchr stytam
- Ptycta haleakalae haleakalae (Perkins, 1899) det. EM  
lower zone; common; VB stytam vacret sopchr dubmen
- Ptycta microctena Thornton, 1984 det. EM  
upper zone; rare; VB stytam

## Family Trogiidae

- \*Cerobasis guestfalica (Kolbe, 1880) det. EM  
lower zone; abundant; VB stytam vacret dubmen sopchr, PF, LE  
NEW HALE RECORD  
The most common and abundant psocopteran in the lower zone, particularly on *Styphelia tameiameiae*.
- \*Lepinotus reticulatus Enderlein, 1905 det. EM  
lower zone; rare; LE  
NEW HALE RECORD  
While this species is currently rare at HALE, it is very abundant in leaf litter in similar habitats on Mauna Kea. It could become more abundant in the future.

**Order Siphonaptera (fleas)**

## Family Ceratophyllidae

- \*Nosopsyllus fasciatus (Bosc, 1800) northern rat flea det. PDK  
lower zone; rare; PF

**Order Thysanoptera (thrips)**

## Family Aeolothripidae

- \*Aeolothrips bicolor Hinds, 1902 det. SN  
lower zone; rare; VB stytam

## Family Phlaeothripidae

- Apterygothrips remotus (Bianchi, 1947) det. SN  
upper zone; rare; PF, VB stytam
- Haplothrips davisii Bianchi, 1946 det. SN  
lower and upper zones; common; LE, PF  
NEW HALE RECORD
- \*Haplothrips gowdeyi (Franklin, 1908) det. SN  
lower zone; rare; VB stytam  
NEW HALE RECORD
- \*Haplothrips leucanthemi (Schrank, 1781) det. SN  
upper zone; rare; VB stytam, PF
- \*Hoplandrothrips sp. det. SN  
lower and upper zones; rare; PF  
NEW HALE RECORD
- <sup>+</sup>Phlaeothripidae sp. det. PDK  
lower zone; rare; LE  
Genus and species undetermined.

## Family Thripidae

- \*Aptinothrips rufus (Goeze, 1778) det. SN  
lower zone; uncommon; LE, PF  
NEW HALE RECORD
- \*Chirothrips manicatus Haliday, 1836 det. SN  
lower and upper zones; uncommon; PF, VB stytam dubmen  
NEW HALE RECORD
- \*Frankliniella crotolariae Mound & Marullo det. SN  
lower zone; uncommon; VB vacret sopchr stytam  
NEW HALE RECORD
- \*Frankliniella occidentalis (Pergande, 1895) det. SN  
lower zone; rare; VB vacret stytam  
NEW HALE RECORD
- Neurisothrips carteri (Moulton, 1937) det. SN  
lower and upper zones; common; VB stytam, PF, LE  
NEW HALE RECORD

- Neurisothrips multispinus (Bagnall, 1910) det. SN  
 lower and upper zones; abundant; VB stytam vacret sopchr dubmen, PF, LE  
 NEW HALE RECORD  
 The most abundant thrips in the study area; extremely abundant on *Styphelia tameiameia*.
- \*Pezothrips kellyanus (Bagnall) det. SN  
 lower zone; common; PF, VB stytam vacret  
 NEW HALE RECORD
- \*Scirtothrips inermis Priesner, 1933 det. PDK  
 lower zone; rare; PF  
 NEW HALE RECORD
- \*Sericothrips staphylinus Haliday, 1836 det. SN  
 lower zone; rare; PF  
 NEW HALE RECORD  
 This species was introduced to Hawaii Island as a biocontrol agent for gorse, *Ulex europaeus*; presumably it is more abundant on its host plant.
- \*Tenothrips frici (Uzel, 1895) det. SN  
 lower zone; uncommon; VB sopchr stytam, PF
- \*Thrips florum Schmutz, 1913 banana flower thrips det. SN  
 lower zone; rare; VB dubmen  
 NEW HALE RECORD
- \*Thrips hawaiiensis (Morgan, 1913) det. SN  
 lower zone; uncommon; VB stytam vacret sopchr dubmen
- \*Thrips imaginis Bagnall, 1926 apple blossom thrips det. SN  
 lower zone; uncommon; PF, LE, VB stytam  
 NEW HALE RECORD  
 This Australian species is a pest of apples; it attacks the flowers (S. Nakahara, D. Tsuda pers. comm.).
- \*Thrips nigropilosus Uzel, 1895 det. SN  
 lower zone; rare; PF  
 NEW HALE RECORD
- \*Thrips tabaci Lindeman, 1889 onion thrips det. SN  
 lower zone; rare; PF, LE

**CLASS MALACOSTRACA (Subphylum Crustacea)****Order Isopoda (isopods)**

## Family Porcellionidae

- \*Porcellio scaber Latreille, 1804 det. PDK  
 lower and upper zones; abundant; PF, LE  
 NEW HALE RECORD  
 Prior reports of the widespread occurrence of *Porcellio laevis* on the west slope of HALE (e.g. Cole et al. 1992) are probably misidentifications of *P. scaber*.

**CLASS CHILOPODA (centipedes)****Order Lithobiomorpha**

## Family Henicopidae

- \*Lamyctes africana (Porat, 1871) det. GE & MZ  
 lower zone; rare; PF  
 NEW HALE RECORD
- \*Lamyctes emarginatus (Newport, 1844) det. GE & MZ  
 lower and upper zones; common; PF  
 NEW HALE RECORD

**CLASS DIPLOPODA (millipedes)****Order Cambalida**

## Family Cambalidae

- Nannolene sp. det. RS  
 upper zone; uncommon; PF  
 It is currently impossible to state whether the endemic Hawaiian species truly belong to the genus *Nannolene* due to the unsatisfactory taxonomic state of the group as a whole (R. Shelley pers. comm.), but we leave this species here until the situation is resolved.

**Order Julida**

## Family Blaniulidae

\*Proteroiulus fuscus (Am Stein, 1857)

det. PDK

lower and upper zones; abundant; LE, PF

## Family Julidae

\*Cylindroiulus sp.

det. RS

lower and upper zones; abundant; LE, PF

NEW HALE RECORD

*Cylindroiulus latestriatus* is the only *Cylindroiulus* species collected from Maui so far; our specimens likely belong to this species.