

New records of nonindigenous Carabidae (Coleoptera) from the Big Island

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Recent surveying for alien threats to populations of the *wēkiu* bug (*Nysius wekiuicola* Ashlock & Gagné) on the slopes and summit of Mauna Kea on the Big Island have revealed additional populations of two carabids, previously thought to be restricted to higher elevations. Their presence at these additional localities, including a new island record, imply that both species may be much more widespread than previously thought. Additional surveying in similar habitat types is recommended and may turn up further specimens. All specimens collected during this survey are vouchered in the entomological collections of the Bishop Museum (BPBM).

Trechus obtusus Erichson, 1837

New island record

Liebherr & Takumi (2002) published the first Hawaiian record of this species from the high elevations of Haleakalā on Maui. The species subsequently expanded its range to a lower elevation at Polipoli, Maui where it was documented to supplant native *Mecyclothorax* spp. (Liebherr & Krushelnycky, 2007). As part of the survey for alien species threats to populations of the native *wēkiu* bug *Nysius wekiuicola* on the summit of Mauna Kea, we collected 3 specimens in an area with grass about 10 meters from the shoreline of Lake Waiau by overturning large rocks and small boulders. In an effort to find more localities for this species, we conducted a short survey along Mana Road at around the 6600-foot level of the eastern slope of Mauna Kea and found a number of specimens of this species in similar rock-and-grass habitats using the same hand-collecting methods as were used at Lake Waiau. The Mana Road survey was unfortunately protracted in order to catch a return flight to Honolulu, but since we found specimens at each of the only four spots we stopped, we estimate that further stops would have provided even further locality data.

Given the fact that this species occurs in a number of localities on the Big Island in less than pristine habitats where few entomologists have ventured to survey for carabids, especially in the last 30 years, it might be possible that it has inhabited the slopes of Mauna Kea in pasture areas for quite some time. Further collecting should be done throughout the Big Island and on Maui in these pasture areas to better ascertain the full range of this species on these islands.

Material Examined. HAWAII¹: 1, Mana Road, Wailuku River headwaters (dry), 6825 ft [2080 m], 19.75008°N, 155.37399°W, 15 Jul 2012, hand collected under rock, N.L. Evenhuis & C. Imada (BPBM); 1, Mana Road, adjacent to entrance of Hakalau National Wildlife Reserve, 6679 ft [2036 m], 19.81906°N, 155.33698°W, 15 Jul 2012, hand collected under rock, N.L. Evenhuis & C. Imada (BPBM); 1, Mana Road, south of entrance of Hakalau National Wildlife Reserve, 6660 ft [2030 m], 19.80050°N, 155.33755°W, 15 Jul 2012, hand collected under rock, N.L. Evenhuis & C. Imada (BPBM); 2, Mana Road, south of entrance of Hakalau National Wildlife Reserve, 6657 ft [2029 m], 19.78540°N, 155.34248°W, 15 Jul 2012, hand collected under rock, N.L. Evenhuis & C. Imada

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(BPBM); 3, Lake Waiau, 10 m E of shoreline, 13,022 ft. [3970 m], 19.8112°N, 155.4774°W, 14 Jul 2012, under rocks and boulders in grassy area, N.L. Evenhuis, C. Imada (BPBM) [identification verified by G.A. Samuelson].

***Agonum muelleri* (Linnaeus, 1758)**

Range extension

On the same survey along Mana Road we also collected a single specimen of the alien ground beetle *Agonum muelleri* under a large partially embedded rock in a pasture. This marks the first record of this carabid from below the summit region of Mauna Kea where it was previously reported by Liebherr *et al.* (2010), although Preston *et al.*, (2012) stated it might possibly occur at lower elevations. The supposition by Preston *et al.* (2012) has been fulfilled; additional surveys in similar pasture habitats searching under rocks and boulders may produce further specimens of this species, which may be more widespread than previously thought. Since relatively few surveys in pasture areas on the slopes of Mauna Kea such as this for alien carabids have been conducted prior to ours, it is equivocal as to whether this species has been present but unnoticed on the Big Island at the lower elevations and made its way up to the summit where it was first collected in 2006, or if the species was originally introduced at the summit and made its way down to the Mana Road pasture areas.

Material Examined. **HAWAII:** 1, Mana Road, south of entrance of Hakalau National Wildlife Reserve, 6660 ft [2030 m], 19.8005°N, 155.3375°W, 15 Jul 2012, hand collected under rock, N.L. Evenhuis & C. Imada (BPBM).

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