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Apiomerus cazieri Berniker and Szerlip
(Hemiptera: Reduviidae: Harpactorinae) predaceous on
Trichodes ornatus Say (Coleoptera: Cleridae: Clerinae)

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Apiomerus cazieri Berniker and Szerlip
(Hemiptera: Reduviidae: Harpactorinae) predaceous on
Trichodes ornatus Say (Coleoptera: Cleridae: Clerinae)

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Abstract. The assassin bug *Apiomerus cazieri* Berniker and Szerlip (Hemiptera: Reduviidae) was observed to prey on the clerid beetle *Trichodes ornatus* Say (Coleoptera: Cleridae). This observation is the first recorded instance of *Trichodes* Herbst as a prey insect, and the second record for reduviid predation on Cleridae.

Key words. Bee assassins, checkered beetles, aposematism, mimicry, Mojave, *Stanleya pinnata*.

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Introduction

Records of predation on Cleridae are few, widely scattered in the literature, and rarely indicate the species identity of the prey insect. Bats (Ross 1967), birds (Sherry 1984), lizards (Best and Gennaro 1984), frogs (Marshall and Camp 1995; Gutiérrez-Cárdenas et al. 2013), spiders (Boulton and Polis 1999; Zhong et al. 2019), and insects (Pollock and Lavigne 2019) have been recorded as preying on clerids, and it is probable they also form part of the diet of insectivorous rodents (e.g. *Onychomys* Baird). Many Cleridae are implicated in mimicry complexes (Mawdsley 1994; Rifkind 2017a), and often bear a striking resemblance to their aposematically colored and chemically protected models. Brightly colored and patterned clerids are believed to gain protection from diurnal predators that exhibit innate or learned avoidance to similarly marked models, which include Coleoptera (Lycidae, Chrysomelidae, Tenebrionidae,) and Hymenoptera (Vespidae and Mutillidae) (Linsley 1959; Rifkind 2017a, b). It is not surprising, then, that the most frequently recorded clerid prey belong to *Phyllobaenus* Dejean, the majority of which lack bold, aposematic coloration (Masonick et al. 2019; Pollock and Lavigne 2019).

Trichodes Herbst is a speciose (85+ spp.) Holarctic genus, comprising moderate to large (greater than 7 mm), brightly marked, diurnal beetles, frequently encountered on flowers. Immature *Trichodes* are specialized nest predators of Hymenoptera, while the adults feed on pollen as well as arthropod prey (Foster 1976). Most *Trichodes* species have elytral patterns composed of alternating black and red, yellow, or orange bands, but they otherwise do not exhibit close morphological resemblance to wasps, bees, or distasteful Coleoptera. (An exception to this is *Trichodes peninsularis* Horn, which has coloration and patterning that closely suggest sympatric *Polistes* de Saussure.) Nevertheless, generalized aposematic coloration alone may offer protection from predators, as even imperfect mimicry can provide defensive advantages (Sherratt 2002). Potential predators of *Trichodes* on flowers include birds, lizards, Hemiptera (Reduviidae), Diptera (Asilidae), and spiders (Oxyopidae; Thomisidae). Of these, only birds and lizards are likely to be deterred by *Trichodes* beetles' aposematic coloration, as the others commonly prey upon various stinging Hymenoptera. Although *Trichodes* are presumably unprotected Batesian mimics, the possibility that they may belong to chemically defended Mullerian mimicry rings should not be discounted. To date, however, no experiments have been conducted to ascertain their palatability to predators. This paper reports a specimen of *Trichodes ornatus* Say as prey, the first recorded instance for the genus.

Apiomerus Hahn is a large (100+ species) genus of New World Reduviidae. Known as bee killers or bee assassins, they use their raptorial forelegs, elongate rostra, and venomous saliva to capture and immobilize arthropod prey (Choe and Rust 2007; Berniker et al. 2011). As their common name indicates, they are notorious predators of flower-visiting bees and wasps, but they also attack and consume coleopteran prey, including chemically protected Coccinellidae. In a recently published study (Masonick et al. 2019), gut content analysis of the reduviid *Phymata pacifica* Evans revealed it to be a predator of the clerid *Phyllobaenus* in coastal sage scrub. The present article records the second known instance of reduviid predation on Cleridae, and the first for *Apiomerus*.

Materials and Methods

Apiomerus cazieri Berniker and Szerlip was determined to species using keys and descriptions in Berniker et al. 2011. The image was taken with an Apple iPhone 7, and edited in Adobe Photoshop.

Specimens are deposited in the collection of Jacques Rifkind, Valley Village, California, U.S.A. (JNRC).

Results

On May 29, 2020, Patricia Gum and I observed an adult female reduviid *Apiomerus cazieri* feeding on a small (7 mm) specimen of the clerid *Trichodes ornatus* Say (Fig. 1). The insects were on yellow blossoms of the perennial *Stanleya pinnata* (Pursh) Britton in upland desert habitat at the southwest limit of the Mojave Desert. Location data are as follows: U.S.A., California, San Bernardino County, Highway 18 at Camp Rock Road, 34°22'26"N, 116°51'43"W, elevation 1167 m. The temperature at 15:15 hours PST was approximately 33°C and many insects, including several species of Hymenoptera, a species of Mordellidae, other *Trichodes* individuals and the clerid *Phyllobaenus robustus* (Horn), were active on the numerous erect *Stanleya* blossoms. The captive *Trichodes* was inanimate and the reduviid appeared to have its proboscis inserted between the clerid's head and prothorax on its ventral side. Both insects were collected before feeding was completed in order to assure capture for later identification.

Discussion

Unlike most Cleridae, which have cryptic habits and often very localized distributions, *Trichodes* are conspicuous and common diurnal visitors to many species of flowering plants across many habitats. While their absence heretofore as prey items in the literature on predation may be largely an artifact of the paucity of such studies, some of that rarity might be credited to the effectiveness of their mimicry of chemically protected Hymenoptera and Coleoptera. That *Trichodes* may fall prey to reduviids which have evolved the capacity to overcome insect chemical defenses, demonstrates a limit to the effectiveness of such mimicry.



Figure 1. *Apiomerus cazieri* feeding upon *Trichodes ornatus*.

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