

Bulletin of the Oregon Entomological Society

Threat Display of *Chelisoches morio* (Dermaptera) *Ron Lyons*

In 2014, I happened to be on vacation in Kaua'i, Hawaii. My wife and I visited Smith's Tropical Paradise in Kapa'a. As we were about to enter, I noticed this large black earwig, *Chelisoches morio* (Black Earwig), on the car and took a few pictures during which time I got to see its impressive scorpion-like display. This earwig, has been found in California mainly on goods shipped from Hawaii but may have become established there (Langston and Powell 1975).

A few years ago, I wrote a summary of the Dermaptera of Oregon for the Bulletin (Lyons 2012). At the time I came across several references in the literature which referred to a similar large black earwing, *Anisolabis maritima* (Maritime Earwig), for Oregon. However, I only found one specific reference—it had been picked up in a cargo inspection of material from Portland, Oregon (Langston and Powell 1975).

Today there still does not seem to be much in the way of specific records for this earwig in the Pacific Northwest, although I did find a few records for Washington and a number of records for British Columbia on iNaturalist.ca (accessed September 2, 2020). There were no new Oregon records.

Anisolabis maritima is similar in size (about an inch long) and appearance to *Chelisoches morio*, but it does not have wings.

Reference

- Langston, R.L. and J.A. Powell. 1975. The Earwigs of California (Order Dermaptera). Bulletin of the California Insect Survey 20: 25 p.
- Lyons, R. 2012. The Earwigs of Oregon (Dermaptera). Bulletin of the Oregon Entomological Society 2012(2, Summer): 7–9.



Chelisoches morio at Kapa'a, Kaua'i, on February 4, 2014. While the open wings make the insect look larger and more formidable, I suspect they also probably help provide some leverage too.

Oregon *Anorostoma* with particular reference to *Anorostoma cinereum* (Diptera: Heleomyzidae)

text and photographs by Ron Lyons

The North American Heleomyzidae is a group of flies with over 110 species (Gill and Peterson 1987). Gill and Peterson (1987) contains a good summary of the family and a key that will take you as far as the genus level. See Savage et al (2019: Superfamily Sphaeroceroidea [SA Marshall and O Lonsdale]) for recent thinking on the taxonomy of this family.

The wings usually have spines along their leading or costal edges (Figure 1 and Figure 3) (the genera *Borboropsis* and *Oldenbergiella* are exceptions in this regard). The 2 bristles on the back of the head behind the ocelli (simple eyes at the top of the head) cross to form an 'X' (Figure 2).

The family is divided into 2 subfamilies, the Suilliinae and the Heleomyzinae. Based on my photographs there are at least 3 species of Heleomyzidae at Bullards Beach State Park in Coos

County near Bandon, Oregon, one of which from the genus *Anorostoma* (Subfamily Heleomyzinae) has distinctive wings.

According to the Canadian National Collection website (<<https://cnc.agr.gc.ca/taxonomy/Taxonomy.php?id=19439>>), the genus *Anorostoma* contains 17 described species. In the latest revision covering the species in North America north of Mexico, Gill (1962) only lists 16 species. The 17th species, *Anorostoma chiloensis*, was described from Chile in South America. Note: While there was some reservation about its placement in *Anorostoma* (Gill 1968), I haven't come across anything that references its resolution.

Nine species of *Anorostoma* have been recorded from the Pacific Northwest (Gill 1962). Based on the available information, 6 species are documented from Oregon, 3 others are likely, and 1

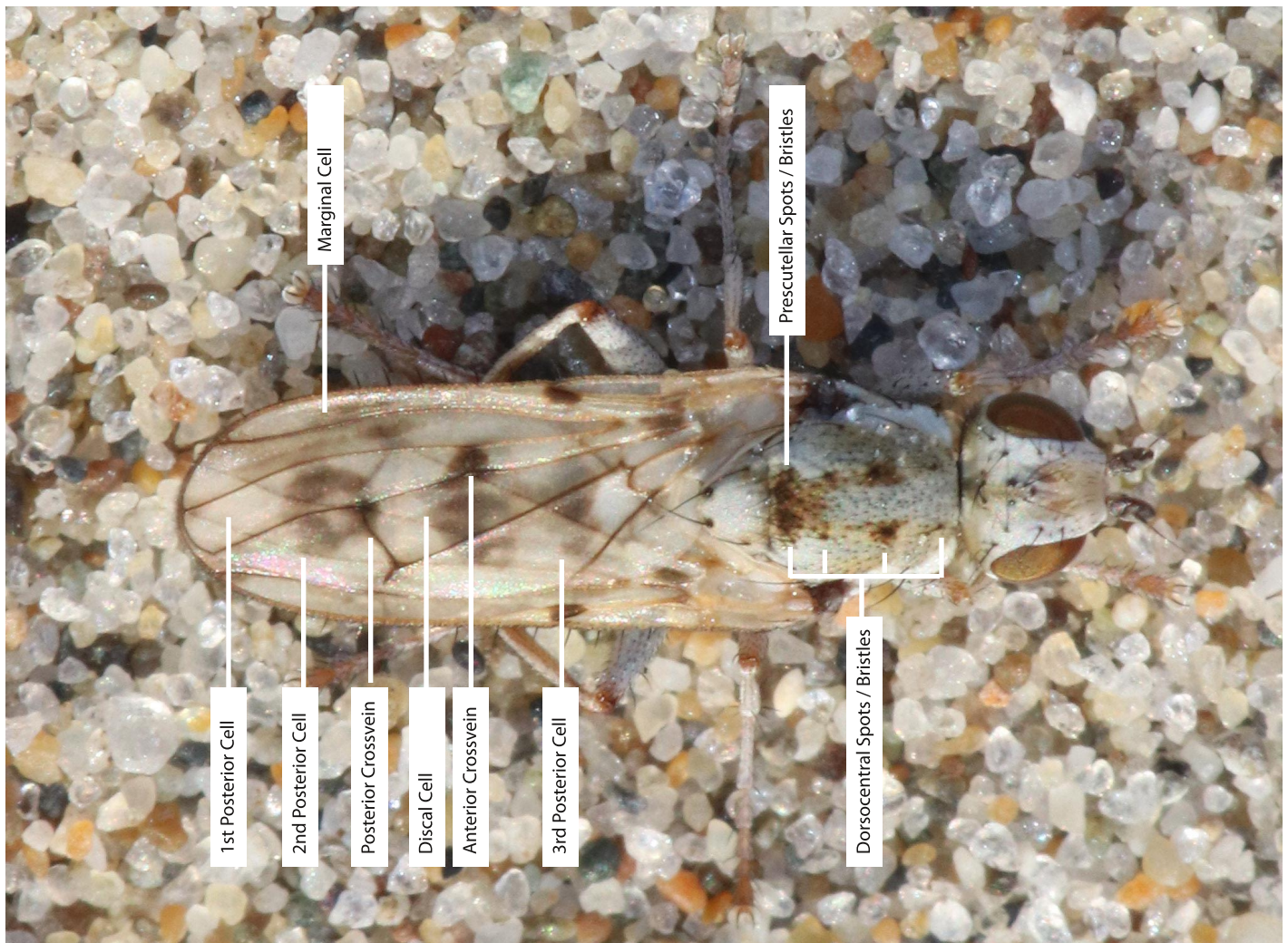


Figure 1. Dorsal view of *Anorostoma cinereum* from August 19, 2020. Note the mottled appearance of the wings—whitish (not completely opaque) with dark and light blackish spots. If you look closely you can see some of the spines along the leading edge of each wing. They are easily lost to view against the sand and/or in images that are slightly out of focus. The spines can more easily be seen on the wings of the male in Figure 3 due to the simpler background.

other is possible. These species, their known general ranges and specific localities are indicated below.

Present in Oregon:

Anorostoma alternans Garrett, 1925

- Washington, Oregon, California (Gill 1962)
- Washington: ? county: Normal (Garrett 1925; type) *
- Washington: Clallam County: Fort Worden – Point Wilson Beach (Hart 2009; BugGuide <<https://bugguide.net/node/view/279103>> **)
- Oregon: Clatsop County: Seaside – Seaside Cove (Patterson 2016; iNaturalist <<https://inaturalist.ca/observations/2864204>>)
- Oregon: Lincoln County: Boiler Bay (Curran 1933)
- California: Contra Costa County: Antioch (Cole 1969)

Anorostoma cinereum Curran, 1932

- Washington, Oregon (Gill 1962)
- Washington (Cole 1969)
- Oregon: Clatsop County: Lewis and Clark Natural History Park (Baker 2013; specimen; BugGuide <<https://bugguide.net/node/view/738457>> **)
- Oregon: Lincoln County: Fogerty Creek (Curran 1932; types, paratypes)
- Oregon: Lincoln County: Boiler Bay (Curran 1932, 1933)
- Oregon: Lincoln County: Boiler Bay (Cole 1969)
- Oregon: Benton County: Corvallis (Cole 1969)

Anorostoma coloradense Garrett, 1924

- Canada: British Columbia, Quebec ; USA: Oregon, California, Nevada, Arizona, New Mexico, Colorado, New Jersey, New York, Massachusetts (Gill 1962)
- Canada: British Columbia; USA: Colorado (Cole 1969)

Anorostoma fumipenne Gill, 1962

- Washington, Oregon (Gill 1962)
- Washington: Pierce County: Mount Rainier (Gill 1962; type)
- Oregon: Klamath County: Lake of the Woods (Gill 1962; paratype)
- Oregon: Deschutes County: Camp Abbot (Gill 1962)

Anorostoma lutescens Curran, 1933

- Washington, Oregon (Gill 1962)
- Oregon: Lincoln County: Boiler Bay (Curran 1933; type)
- Oregon: Lincoln County: Boiler Bay (Cole 1969)

Anorostoma wilcoxi Curran, 1933

- Washington, Oregon, California (Gill 1962)
- Oregon: Lincoln County: Boiler Bay (Curran 1933; type, paratype)
- Oregon: Benton County: Corvallis (Curran 1933)
- Washington, northern California (Cole 1969)

Likely present in Oregon:

Anorostoma grande Darlington, 1908

- Washington, California (Gill 1962)
- California: sand dunes near San Francisco (Cole 1969)
- California: Monterey County: Pacific Grove – wet meadow about a mile south of Point Pinos Light specifically mentioned (Aldrich and Darlington 1908; as *grandis*)
- California: San Francisco County: Golden Gate Park – nearby sand dunes (Cole 1969)
- California: Monterey County: Pacific Grove; ranges north to Washington (Cole 1969)

Anorostoma jersei Garrett, 1924

- Alaska, Washington, Oregon?, California, Utah, Arizona, Colorado, New Mexico, Nebraska, Michigan?, New Jersey (Gill 1962)
- California: Mono County; goes north to Alaska (Cole 1969)

Anorostoma maculatum Darlington, 1908

- California (Gill 1962)
- California: Del Norte County: Crescent City (Hauser 2009; BugGuide <<https://bugguide.net/node/view/284834>>)
- California: sand dunes near San Francisco (Cole 1969)
- California: San Mateo County: Pescadero (Schusteff 2009; BugGuide <<https://bugguide.net/node/view/301344>> **)
- California: San Mateo County: Pescadero State Beach (Schusteff 2009; BugGuide <<https://bugguide.net/node/view/311751>> **)
- California: Monterey County (Curran 1933)
- California: Monterey County: Pacific Grove – sand dunes south of Point Pinos Light are specifically mentioned (Aldrich and Darlington 1908; as *maculata*).
- California: sand dunes near Pacific Grove (Cole 1969)

Anorostoma grande is placed here based on its presence in the adjacent states Washington and California. *Anorostoma jersei* has a widespread distribution including adjacent states. Gill (1962) placed a question mark after Oregon because he did not examine any males from Oregon. The record of *Anorostoma maculatum* from Crescent City is just a few miles south of the Oregon border. All 3 species are likely present in Oregon.

Possibly present in Oregon:

Anorostoma currani Garrett, 1922

- Canada: British Columbia, Manitoba; USA: Washington, Colorado, Montana, North Dakota (Gill 1962)
- Canada: Manitoba: Teulon (Garrett 1922, type)
- Washington, Montana (Cole 1969)

* Jim Johnson and I have been unable to find Normal, Washington. In addition, Cole (1969) erroneously states that the type is from British Columbia, Canada.

** On BugGuide.net, multiple images can be supplied to support of a specific observation. In these cases, the link shown only applies to one of the images.

Anorostoma currani appears to have a widespread, if perhaps northern, distribution based on the state list; since it is found in Washington, its presence in Oregon cannot be ruled out.

Little recent work appears to have been done on this genus; some species are in need further taxonomic work while others need work done on their distributions. As can be seen above, few actual locations are indicated either in the published works or on the image websites BugGuide.net and iNaturalist.ca. Gill (1962) is based on Gill's (1959) PhD thesis; unfortunately, the thesis, like the publication, lists only state records—specific locality records are not included. In addition, the number of specimens examined is not always indicated.

The early keys of Curran (1932; 7 species), and Curran(1933; 12 species) have been superseded by the revision given in Gill (1962: 514; 16 species). Note: Gill does not use the Comstock–Needham terminology for the wing venation in his key, but rather an older system (see the illustrations in Borror, Triplehorn and Johnson [1992: 505, Figure B] or Essig [1947: 730, Figure 264]).

In Gill's (1962) identification key for the genus *Anorostoma*, the first couplet divides the species by the appearance of the wings. For some species, the whitish wings are “somewhat opaque,” and marked with gray areas. These wings appear mottled. The majority of the species have wings that are clear or “tinged with yellowish brown or black.” These wings do not appear mottled.

One of the species of *Anorostoma* at Bullards Beach State Park has

strongly mottled wings (Figure 1 and Figure 3). Based on Gill's revision, there are only 3 species that fit this category:

- Anorostoma cinereum* (Washington and Oregon)
- Anorostoma opacum* (California: Los Angeles)
- Anorostoma maculatum* (California)

These species can be separated by the color of the area between the base of the antennae and the eyes. In *Anorostoma opacum* and *Anorostoma maculatum*, this area has a black spot. *Anorostoma cinereum* lacks this black spot. At the moment, *Anorostoma cinereum* is also the only one of these known to occur in Oregon and is identified as the species in the accompanying images.

Some features from the description of *Anorostoma cinereum* presented by Gill (1962) are illustrated in the accompanying figures:

“Wings mostly whitish, with darkened gray areas near the end of the subcostal vein, along the anterior crossvein, along the anterior half of the posterior crossvein, in the discal cell, and in the first, second, and third posterior cells; in the marginal cell (cell R1), there is a very small, hardly noticeable gray area” (Figure 1).

“The area between antenna and eye appearing yellowish orange to silvery gray, depending upon the light, but never as a blackish spot.” In most of the individuals in my images this area appears as a narrow brownish band (Figure 2).

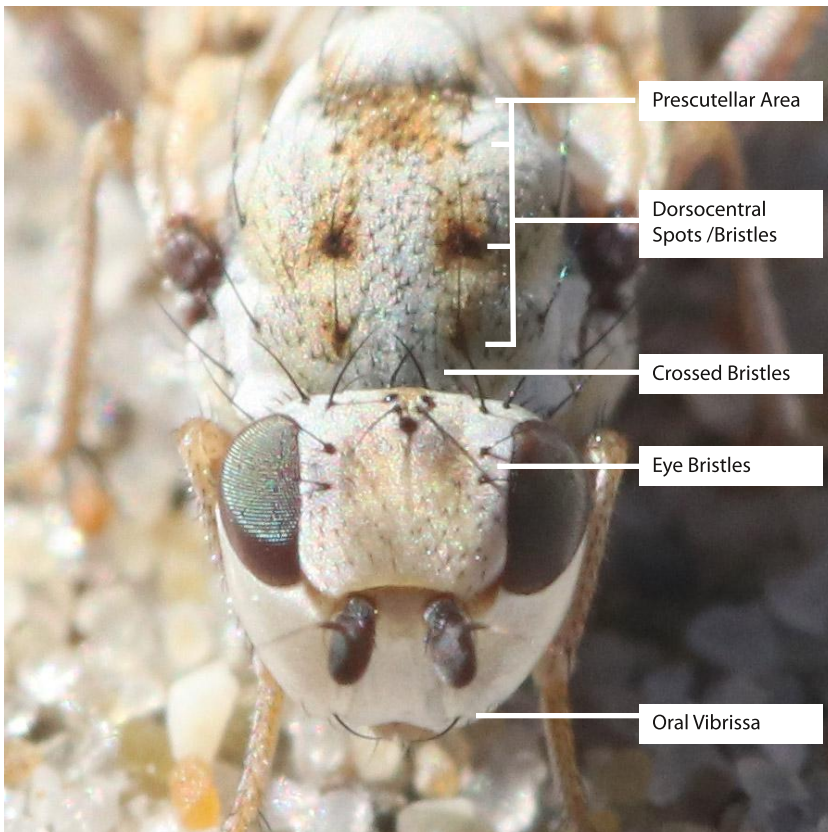


Figure 2. Head and thorax of *Anorostoma cinereus* from an image taken September 7, 2020. After posing for a bit, this insect obligingly approached the tripod and camera so I could get a better view.

Note the insect's head. There is a pair of bristles crossing near the mouth— these are called the oral vibrissae. The darkened area between the antennae and the eyes has no black spot as in *Anorostoma maculatum*. The area appears darker because of the changes in the aspect angle and shading—there is a curved indentation here. The insect has a pair of black bristles on the front of the head near each eye. The pair of crossed bristles in the middle at the back of the head are characteristic of this family.

On each side of the thorax there is a set of 4 bristles in a line running from the front of the thorax to the rear. Three of these dorsocentral bristles are fairly obvious partly because they arise from darkened spots. The fourth bristle is not as obvious—the darkened spot is broader and contains a dark brush-like series of bristles/hairs which create confusion; in addition since this area is not as well focused it appears fuzzy. In my images that are well enough focused this brush-like series of bristles/hairs is present. This feature is not mentioned in the species description; I don't know if it has a special purpose.

Note: There is some confusion on this image due to the shadows created by the bristles.



Figure 3. Mating pair of *Anorostoma cinereus* photographed at the top of the foredune at Bullards Beach State Park in Coos County, Oregon on August 19, 2020.

“The 2 darkened areas through the dorsocentrals may merge in the region of the prescutellars” (i.e., the spots farthest from the head) (Figure 1). There is no mention of the additional bristles or hairs that accompany the prescutellar dorsocentral bristle that can be seen in the images, like a small comb (Figure 2).

All of the specimens of *Anorostoma cinereum* examined by Gill (1962) were collected in coastal areas (Corvallis, a locality listed by Cole [1969], is not on the coast); specimens were collected during May, July, August and October. Gill noted that its habits “are probably similar to *Anorostoma maculatum*”—“these flies are common in sand-dune areas, where they fly close to the sand and so resemble grains of drifting sand. ... their mottled color blends perfectly with the sand.”

At Bullards Beach State Park, I find these small flies resting on the sand in the openings on the pedestrian/horse paths at, or near, the top of the foredune, usually in the sun. Their small size and

cryptic coloration make them hard to pick out against the sand. In flight they tend to stay close to the surface, perhaps, in part, at least, to stay out of the wind. They did not fly great distances to escape my disturbance, but they can be difficult to get close to for photography. I have found these flies in April, August 19 through September 29, and November; mating pairs were photographed on April 19, 2018, August 19 and 20, 2020 (Figure 3 and Figure 4), and November 8, 2011.

The presence of *Anorostoma cinereum* this far south makes it possible that its distribution extends into northern California.

Acknowledgements

I would like to thank Jim Johnson for his help in the unsuccessful search to find the location of Normal, Washington.

I could not have compiled this note without the help of numerous



Figure 4. Mating pair of *Anorostoma cinereus* photographed Bullards Beach State Park in Coos County, Oregon on August 20, 2020.

websites that make copies of various papers available: the Biodiversity Library, the American Museum of Natural History digital library, the new Diptera site, the Smithsonian Institution repository, and Zookeys. In addition, I was aided by two sites that aggregate various arthropod images: BugGuide.net and iNaturalist.ca; thanks to Stephen Hart, Mike Patterson, Austin Baker, Martin Hauser and Aaron Schusteff for posting their images on these sites.

Finally, I would like to thank Washington State University Holland and Terrell Libraries for making Gill's (1959) thesis available to me through an interlibrary loan and the Bandon (Oregon) Public Library for facilitating that loan.

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Reminder – Editor Wanted

Just a reminder that a new editor is needed for the Bulletin. The new editor will be responsible for the Spring 2021 issue due out near the beginning of April. If you are interested in this volunteer position, please contact Ron Lyons at pondhawk@uci.net for details. Thank you.