

**TABLE 4.** Comparative chaetotaxy of the Diminutiva Group.

species	n	forefemur dorsal surface	foretibia auditory foramen	foretibia ventro- anterior margin	foretibia ventro- posterior margin	midfemur dorsal surface	midtibia dorso- anterior margin	midtibia dorso- posterior margin	midtibia ventro- anterior margin	midtibia ventro- posterior margin
<i>diminutiva</i>	7	0-4	1	6-7	6-7	0-3	2-3	2-3	6-8	5-7
♀	7	0-4	1	6	6	2-3	2-3	3	7	6-7
<i>constrictans</i>	18	0-4	0-1	6	5-6	1-3	2-3	2-3	5-8	5-7
♀	13	1-4	0-1	6	6	1-3	1-3	2-3	6-8	6-7
<i>dactyla</i>	17	0-4	1	6	6-7	1-3	2-3	1-3	6-7	5-7
♀	11	0-4	1	6	6	0-3	1-3	3	7	6-7
<i>acrolophitus</i>	15	0-3	0-1	6	6-7	0-3	1-3	2-3	6-8	5-7
♀	11	0-4	1	5-6	5-6	0-3	1-3	2-4	7	5-7
<i>oreibates</i>	6	3-5	1	6-7	6	1-3	2-3	3	6-7	5-7
♀	5	1-5	1	6	6	0-4	2-4	2-4	6-7	6-7
<i>poecilonoium</i>	6	0-3	1	6	6	1-3	2-3	3-4	6-7	6-7
♀	5	1-3	1	5-6	6	1-3	2-3	3	6-7	6-7

## Diminutiva Group

The Diminutiva Group is, like the Morsei Group, a clade of small *Aglaothorax*. The prosternal spines are typically long and divergent, occasionally reduced and nipple-like. Like the other *Aglaothorax* species Groups, chaetotaxy is more variable within species than between (Table 4). The male supra-anal plate of this group is characteristically heart-shaped, indented along the posterior margin and expanded posterolaterally into two lobes (Figs. 28–33, Plate 6). The male subgenital plate has a wide posterior margin that is rounded to transverse and with long cylindrical styli (Figs. 28–33). The male paraprocts have the internal tooth situated apically (Figs. 28–33, Plate 6). In all but one species (*A. constrictans*) the male titillator arms are long, slender, and strongly curved laterally, often bowed (Plate 13). The female subgenital plate in all but one species (again *A. constrictans*) has long, digitiform lateral processes (Figs. 28–33, Plate 9). The female ovipositor is shorter than the hind femur, approximately 3/4 its length, and regularly upcurved (Figs. 28–33).

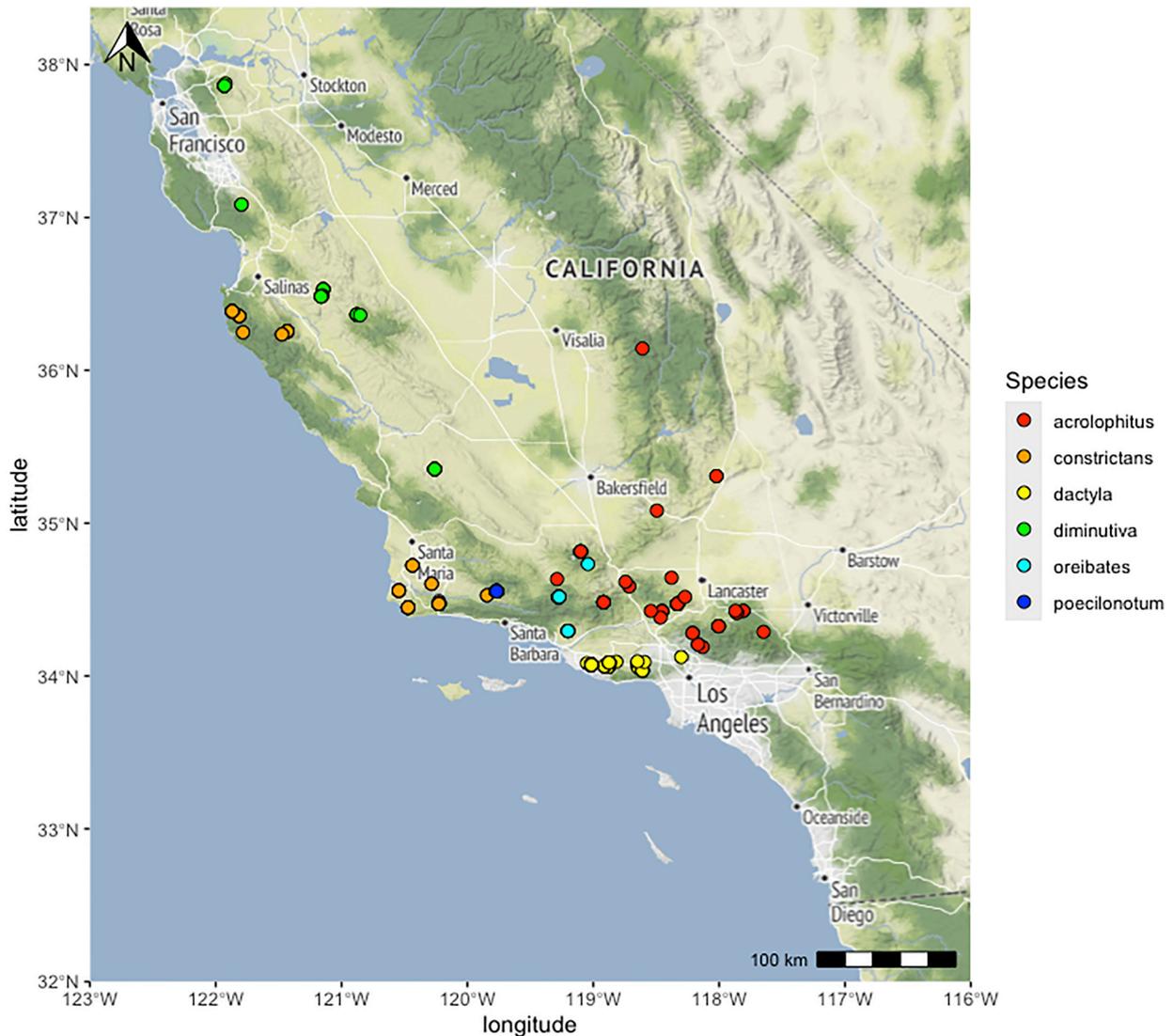


FIGURE 28. Distribution of Diminutiva Group species.

Diminutiva Group males produce a calling song with irregular, often long echemes (bouts) of widely spaced pulse trains (Plate 15). Male choruses may synchronize or alternate pulse train production. The acoustical activity of several species may begin late at night and continue until dawn, becoming more frequent as the night progresses.

The Diminutiva Group is most speciose in the South Coast Ranges of California, but a widespread species occurs in the Tehachapi Mountains at the eastern extreme of the Transverse Ranges where they join the southern

Sierra Nevada (Fig. 28). The Transverse Ranges represent a region of sympatry with members of the Morsei Group marked by extensive mitochondrial capture (Fig. 3). Apart from incidences of capture, the Diminutiva Group species are well resolved phylogenetically (Figs. 2–4).

### *Aglaothorax diminutiva* (Rentz & Birchim, 1968)

*Neduba* (*Aglaothorax*) *diminutiva*—Rentz & Birchim 1968: 63

Fig. 28 (distribution), Fig. 29 (male and female habitus, calling song, male and female terminalia, karyotype), Plate 6 (male terminalia), Plate 9 (female subgenital plate), Plate 13 (male titillators), Plate 15 (male calling song).

**Common name.** Diminutive Shieldback.

**History of recognition.** Described in *Neduba* (*Aglaothorax*) from Mount Diablo, Contra Costa County, California (Rentz & Birchim 1968). Support for species status came from a divergent karyotype (Ueshima & Rentz 1979). Three subspecies were then described from Southern California: *constrictans*, *dactyla*, and *malibu* (Rentz & Weissman 1981), the first of these without female specimens and the second from a female holotype. Below, we elevate the first two subspecies to species rank and synonymize the third under *A. dactyla*.

**Type material.** The holotype male is deposited at Academy of Natural Sciences at Philadelphia. Images of the holotype are available at OSFO (Cigliano *et al.* 2025). TOPOTYPES EXAMINED: (n=11) **USA, CA, Contra Costa Co.**, Mount Diablo State Park, 37.862703, -121.93107, 1160 m, 1-IX-2002, d B Weissman, CAS, 1♀; same data except 13-VIII-1994, d B Weissman, CAS, 1♂; same data except 37.881038, -121.916706, 1142 m, 11-VIII-1990, d B, d W Weissman, CAS, 5♀; Mount Diablo State Park, Juniper Camp, 37.862703, -121.93107, 886 m, 17-VIII-1965, d C, KA Rentz, CAS, 1♂; same data except 28-VIII-1982, d B Weissman, CAS, 1♂; Mount Diablo State Park, Muir Picnic Area, 37.8764, -121.9208, 1001 m, 20-21-VII-2005, JA Cole, LACM, 1♂; Mount Diablo State Park, summit, 37.862703, -121.93107, 1220 m, 13-VIII-1991, d B Weissman, CAS, 1♀.

**Measurements.** (mm, ♂n=8, ♀n=7) Hind femur ♂12.21–13.68, ♀13.85–16.27, pronotum total length ♂7.00–8.23 ♀7.00–7.75, prozona length ♂2.79–3.49, ♀3.21–4.36, metazona dorsal length ♂4.00–4.83, ♀2.84–4.35, pronotum constriction width ♂2.34–2.96, ♀2.60–3.50, metazona dorsal width ♂5.00–5.57, ♀4.85–5.40, head width ♂3.56–3.95, ♀4.25–4.69, ovipositor length ♀11.21–12.24.

**Distribution.** Interior South Coast Ranges of California. Type material is from the northernmost extent of these mountains in the Diablo Range, but we have determined specimens from throughout the interior South Coast Ranges.

**Habitat.** Chaparral and oak woodland understory. On Sage (*Salvia* spp.), Mountain Mahogany, Coast Live Oak (*Quercus agrifolia* Née), Scrub Oak (*Quercus* spp.), and Poison Oak.

**Seasonal occurrence.** Adult activity from spring (12-VI-2008, JA Cole, LACM) through summer (6-IX-2002, JA Cole, LACM).

**Stridulatory file.** (n=6) length 2.80–3.40 mm, 83–110 teeth, tooth density 32.0±1.6 (29.6–34.3) teeth/mm.

**Song.** (n=18) The common small *Aglaothorax* song with slowly produced, widely spaced pulse trains that occur slow enough that a human listener may count them. Pulse trains 70±40 ms in length are delivered at a rate of 4.34±0.88 s<sup>-1</sup>. Mean peak frequency is 15.14±4.54 kHz; high frequency recording equipment detected ultrasonic peak frequencies as high as 33.00 kHz. Echemes contain a variable number of pulse trains, typically a high number (mean 39±22, range 12–83 pulse trains). The echeme repetition rate range is 1–6 min<sup>-1</sup>. Acoustical activity intensifies as the night wears on. At the type locality, in Juniper Camp, a few paltry calls were heard before 2330 h. Upon awakening at 0130 h, some 15 males were calling in the same area. In San Luis Obispo County, singing did not begin in earnest until after 2330 h on 12-VI-2008, and in San Benito County on 10-VIII-2017, singing was frequent only after midnight.

**Karyotype.** (n=2), 2n♂=23(20t+Xm+Xt+y m), topotype T82-114 (S82-113). Ueshima and Rentz (1979) show the X<sub>1</sub> as a submetacentric, a condition confirmed at anaphase II in T82-114 (not shown in Fig. 28). The same karyotype was found from a population at Pinnacles National Park (Ueshima & Rentz 1979), confirming placement with this species. The sex determination is unique among *Aglaothorax*, a neo-X<sub>1</sub>X<sub>2</sub>Y system also shared with five species of *Neduba*: *N. arborea* Cole, Weissman, and Lightfoot, *N. duplocantans* Cole, Weissman, and Lightfoot, *N. inversa* Cole, Weissman, and Lightfoot, *N. prorocantans* Cole, Weissman, and Lightfoot, and *N. sierranus* (Rehn & Hebard) (Cole *et al.* 2021).

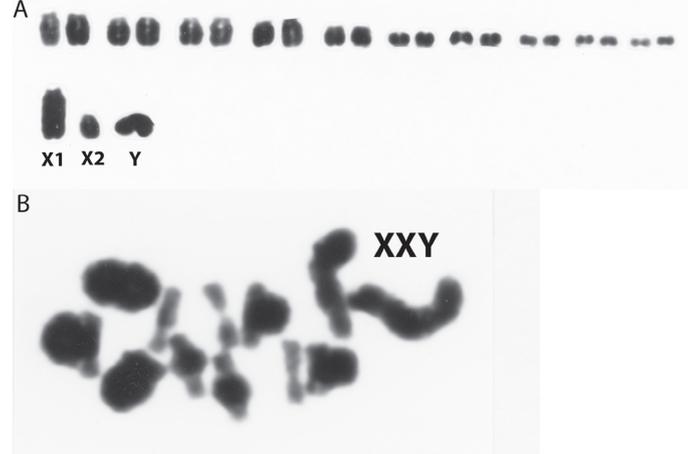
male TOPOTYPE USA. CA: Contra Costa Co. S94-96, R94-191



calling song TOPOTYPE USA. CA: Contra Costa Co. 25.0°C R94-191



karyotype TOPOTYPE USA. CA: Contra Costa Co. S82-113, T82-114



female TOPOTYPE USA. CA: Contra Costa Co. S90-87



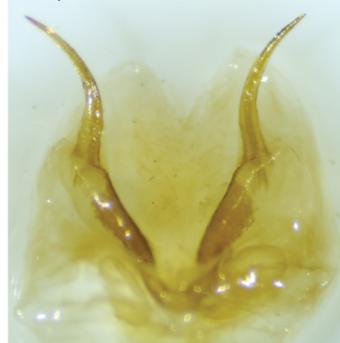
male terminalia TOPOTYPE USA. CA: Contra Costa Co.



female USA. CA: San Benito Co. JAC000006520



titillators USA. CA: San Luis Obispo Co. JAC000002570



female subgenital plate TOPOTYPE USA. CA: Contra Costa Co.



**FIGURE 29.** *A. diminutiva* male and female habitus, calling song, male and female terminalia, and karyotype. A. Idiogram, *A. diminutiva*, type locality T82-114 (S82-113) showing  $X_1X_2Y$  sex chromosome system; B. Metaphase I in same male showing association of all 3 sex chromosomes, with submetacentric  $X_1$  and submetacentric Y apparent.

**Recognition.** Morphology, geography, karyotype. The male supra-anal plate is heart shaped, expanded after the base and indented along the caudal margin, and the titillator arms are long and bowed, character states that exclude all Morsei Group species. Likewise characteristic of the Diminutiva Group and exclusive of much of the Morsei Group, the male paraproct process has an apical tooth. Also occurring in the South Coast Ranges is *A. constrictans*, but in that species males have short, slightly curved titillator arms and females have short triangular subgenital plate lateral processes that are barely longer than wide. Female *A. diminutiva* have the subgenital plate lateral processes much longer than wide, and the processes meet the transverse caudal margin of the plate with a slight angle. Female *A. constrictans* have short, triangular subgenital plate processes that are scarcely longer than wide. Other Diminutiva Group species have the processes broadly rounded mesally onto the caudal margin of the plate. The processes of *A. diminutiva* are shorter and wider than those of *A. dactyla*. This is the only *Aglaothorax* species along the interior South Coast ranges and has the most northern distribution of any member of the genus. The *A. diminutiva* karyotype is unique among small *Aglaothorax* at  $2n\sigma=23$ .

**Notes.** Mount Diablo is a region of high endemism, particularly for Orthoptera where it is also the type locality of the endemic *Neduba diabolica* (Scudder) as well as the more wide-ranging *Capnobotes attenuatus* (Scudder). The lifespan of wild caught adults may be long: a female captured by DBW on 1-IX-2002 at the type locality lived until 8-XII and laid many eggs. *Ormia* parasitoid flies emerged within 5–7 days from each of five males brought back to the laboratory from Laguna Mountain Recreation Area, San Benito County. These males were collected late in the season in mid-August. We speculate as to whether the prevalence of early evening *Ormia* activity may be a factor that explains late night calling.

**Material examined.** (n=24) **All USA, CA, San Benito Co.,** Pinnacles Nat. Mon., Chalone Camp, 36.530796, -121.145198, 8-VII-1967, d C, KA Rentz, CAS, 1♂; Pinnacles Nat. Mon., Chalone Campground, 36.530796, -121.145198, 12-VIII-1982, d B Weissman, CAS, 1♂; Pinnacles National Monument, 36.530796, -121.145198, 427 m, 25-VII-1982, PH Sullivan, LACM, 1♀; Pinnacles National Park, Pinnacles Campground, 36.48970, -121.15072, 311 m, 6-VII-2023, JA Cole, C Wong, 1♂ song record; Pinnacles National Park, Pinnacles View Area, 36.48309, -121.16313, 306 m, 6-7-VII-2023, JA Cole, C Wong, LACM, 2♂; same data except JAC, 1♂, 1♀; Short Fence Trailhead, Coalinga Road, Laguna Mountain Recreation Area, BLM, 36.36403, -120.87840, 670 m, 10-11-VIII-2017, JA Cole, AMNH, 1♂; same data except LACM, 4♂; Upper Sweetwater Campground, Coalinga Road, Laguna Mountain Recreation Area, BLM, 36.36067, -120.85256, 848 m, 10-11-VIII-2017, JA Cole, 1♂ song record; **San Luis Obispo Co.,** La Panza Campground, Los Padres National Forest, 12 miles northeast of Pozo, 35.3538, -120.2606, 732 m, 12-13-VI-2008, JA Cole, LACM, 2♂; same data except JAC, 2♂; same data except 9-10-VI-2002, JA Cole, AMNH, 1♂; same data except LACM, 2♂; same data except JAC, 1♂; **Santa Clara Co.,** Uvas Canyon County Park, 15 miles west of Morgan Hill on Croy Road, 37.0855, -121.7954, 349 m, 6-IX-2002, JA Cole, LACM, 1♂; same data except JAC, 1♂.

### *Aglaothorax constrictans* (Rentz & Weissman, 1981) stat. rev.

*Neduba (Aglaothorax) diminutiva constrictans*—Rentz & Weissman, 1981: 92

*Aglaothorax constrictans* stat. rev. (Revised to species level).

Fig. 28 (distribution), Fig. 30 (male and female habitus, calling song, male and female terminalia, karyotype), Plate 6 (male terminalia), Plate 9 (female subgenital plate), Plate 13 (male titillators), Plate 15 (male calling song).

**Common name.** Constricted Shieldback.

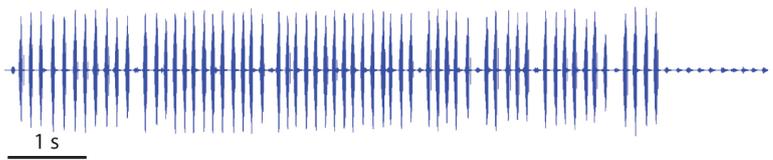
**History of recognition.** Described as a subspecies of *Neduba (Aglaothorax) diminutiva* from male material only (Rentz & Weissman 1981). We elevate this taxon to species rank based on aberrant morphology for the Diminutiva Group in both males and females, and due to the appreciable genetic distance from other Diminutiva Group lineages.

**Type material.** The type series was collected from a dune area near the lighthouse at Bixby Ranch, Point Conception, Santa Barbara County, California. Images of the holotype and a paratype are available at OSFO (Cigliano *et al.* 2025). PARATYPES EXAMINED (n=13): **USA, CA, Santa Barbara Co.,** Point Conception, Bixby Ranch, dunes nr. Lighthouse, 34.44860, -120.47155, 8-VI-1971, d C Rentz, d B Weissman, CAS, 1♂; same data except 8-VII-1971, d C Rentz, d B Weissman, CAS, 1♂; same data except 8-VIII-1974, d C Rentz, d B Weissman, CAS, 11♂.

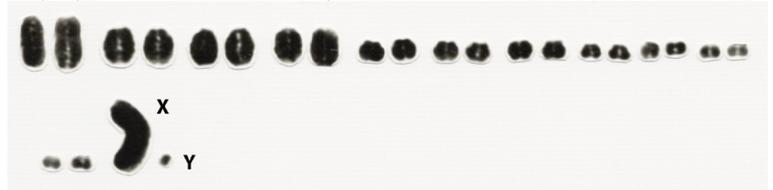
male USA. CA: Santa Barbara Co. S82-51



calling song USA. CA: Santa Barbara Co. 25.8°C JCR130827\_03



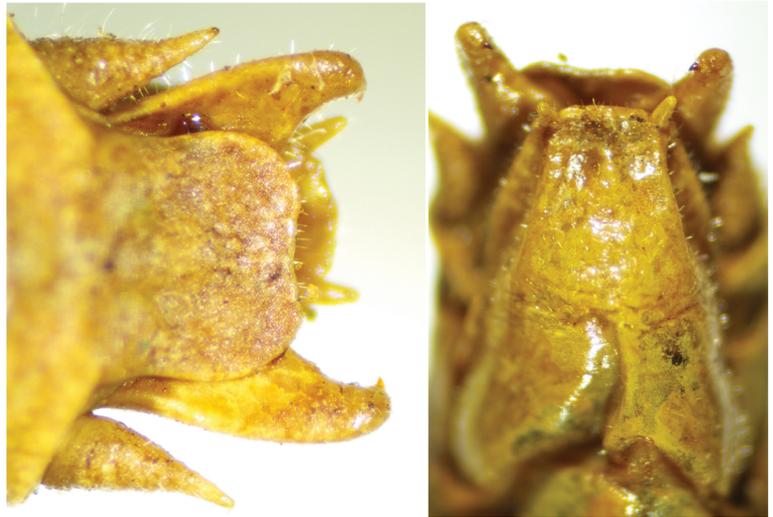
karyotype USA. CA: Monterey Co. S82-46, T82-47



female USA. CA: Monterey Co. JAC000002558



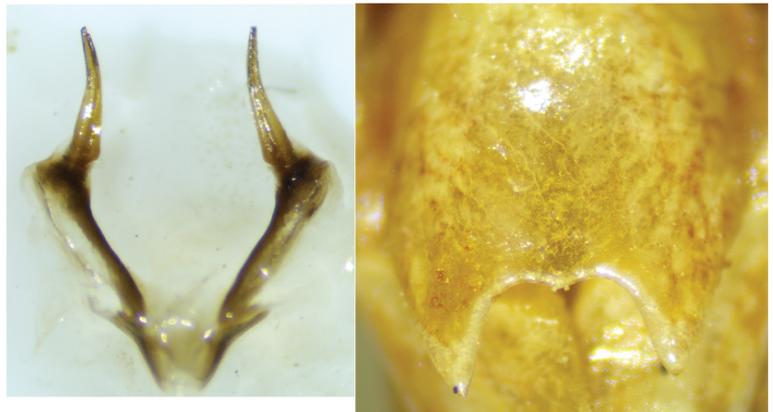
male terminalia PARATYPE USA. CA: Santa Barbara Co.  
R V



male USA. CA: Monterey Co. JAC000002555



titillators USA. CA: Santa Barbara Co. JAC000002537 female subgenital plate USA. CA: Santa Barbara Co. S82-51



**FIGURE 30.** *A. constrictans* male and female habitus, calling song, male and female terminalia, and karyotype. Idiogram shows karyotype  $2n\♂=24$ .

**Measurements.** (mm,  $\♂n=18$ ,  $\♀n=13$ ) Hind femur  $\♂12.45\text{--}15.05$ ,  $\♀14.70\text{--}18.37$ , pronotum total length  $\♂7.20\text{--}9.15$ ,  $\♀7.16\text{--}9.50$ , prozona length  $\♂3.34\text{--}3.94$ ,  $\♀1.34\text{--}4.76$ , metazona dorsal length  $\♂3.84\text{--}5.24$ ,  $\♀3.35\text{--}5.85$ , pronotum constriction width  $\♂2.40\text{--}5.47$ ,  $\♀2.45\text{--}3.55$ , metazona dorsal width  $\♂5.15\text{--}6.51$ ,  $\♀5.05\text{--}6.58$ , head width  $\♂3.40\text{--}3.95$ ,  $\♀4.00\text{--}4.60$ , ovipositor length  $\♀10.55\text{--}11.79$ .

**Distribution.** South Coast Ranges of California bordering the Pacific Ocean. Distribution extends from Point Conception north through the Santa Lucia Range.

**Habitat.** Coastal dunes, coastal sage scrub, chaparral, and oak savanna from the beachfront to mountain slopes.

**Seasonal occurrence.** Adult activity spans late spring (4-VI-2006, JA Cole, LACM) through summer (8-IX-2002, JA Cole, LACM).

**Stridulatory file.** (n=16) length 3.00–3.90 mm, 84–107 teeth, tooth density  $28.7 \pm 2.3$  (23.3–32.1) teeth/mm.

**Song.** (n=19) Common small *Aglaothorax* song with widely spaced, individually countable pulse trains. Length of pulse trains is  $50 \pm 20$  ms. Pulse trains repeat at a rate of  $5.31 \pm 0.69$  s<sup>-1</sup>. Mean peak frequency is  $14.35 \pm 0.77$  kHz. Long, variable echemes contain on average  $38 \pm 19$  (range 12–89) pulse trains. Silent intervals between echemes range from 7 to 29 s.

**Karyotype.** (n=4)  $2n \text{♂} = 24$  (22t+Xty t), paratype T82-47 (S82-51).

**Recognition.** Typical for the Diminutiva Group, the male supra-anal plate is heart-shaped, expanded laterally and indented on the caudal margin, and the paraproct processes have an apical tooth. Otherwise, the morphology of this species is aberrant for the Diminutiva Group, the male titillators and female subgenital plate instead resembling those of the Morsei Group. Male titillator arms are short and barely curved as opposed to long and distinctly curved, the condition found in all other Diminutiva Group species. Females have short, triangular subgenital plate processes instead of long, digitiform processes as in the rest of the Diminutiva Group. For males, the apical position of the mesal tooth on the paraproct process excludes most Morsei Group species from consideration; *A. amathitis*, *A. costalis*, *A. longipennis*, and *A. morsei* all have a subapical tooth on the paraproct process along with a rounded supra-anal plate. The male titillator arms are notched at the base, a character state shared only with *A. morsei*. The female subgenital plate lateral processes are longer than wide unlike all Morsei Group females except *A. kelainops*.

**Notes.** This species is genetically a member of the Diminutiva Group (Figs. 2–4) but possesses morphology that is characteristic of the Morsei Group. Genetically, the closest relative is *A. diminutiva* which occurs in the South Coast Ranges to the east. Shared morphology may be the result of historical gene flow. Currently the ranges of *A. constrictans* and *A. diminutiva* are separated by the Salinas Valley. Other Morsei Group and Diminutiva Group lineages are found in the area where the Transverse and Peninsular Ranges meet in Ventura and Santa Barbara Counties, California, but we have not found any occurrences of sympatry. This species was, however, sympatric with both *Neduba carinata* Walker and *N. lucubrata* Cole, Weissman, & Lightfoot at Bottcher's Gap in the Ventana Wilderness of the South Coast Ranges of California, this occurrence representing the highest count of sympatric nedubine species that we have encountered. The Nature Conservancy protected 25,000 acres of the Bixby Ranch type locality at Point Conception in 2017.

**Material examined.** (n=51) **All USA, CA, Monterey Co.,** 0.9 miles E of Arroyo Seco and G17, intersection on Arroyo Seco, 36.25466, -121.43208, 192 m, 12-VIII-1982, d B Weissman, CAS, 6♂, 4♀; Arroyo Seco Rd., 0.6 mi. W of intersection with G6, 36.235139, -121.473392, 274 m, 29-VII-1983, d B Weissman, CAS, 1♂, 1♀; Big Sur, SR1, 36.3547, -121.8136, 685 m, 20-VIII-2012, JA Cole, 1♂ sound recording; Bottcher's Gap, Los Padres National Forest, 19 miles north of Big Sur off SR1 on Palo Colorado Road, 36.3550, -121.8138, 652 m, 20-21-VIII-2012, JA Cole, LACM, 1♀; same data except JAC, 1♀; Bottcher's Gap, Los Padres National Forest, 19 miles north of Big Sur off SR1 on Palo Colorado Road, 36.3550, -121.8138, 652 m, 7-8-IX-2002, JA Cole, LACM, 1♂; Palo Colorado Rd., 3 mi. E of SR1, 36.3864, -121.8687, 327 m, 20-VIII-2012, JA Cole, LACM, 5♂, 1♀, 2 pairs in copula; same data except JAC, 1♂, 1♀; Pfeiffer Big Sur State Park, 36.248852, -121.782732, 5-VII-1986, d B & B Weissman, CAS, 1♂; **Santa Barbara Co.,** Gaviota Pass Rest Area, 34.489433, -120.225984, 22 m, 14-VIII-1986, B Hebert, CSUN, 1♀; Gaviota State Park, 34.47222, -120.22722, 4 m, 20-21-VIII-2013, JA Cole, AMNH, 1♂; same data except LACM, 8♂, 1♀; same data except JAC, 3♂; Harris Grade Road, 5 miles north of Lompoc, 34.7238, -120.4368, 216 m, 3-VI-2006, JA Cole, JAC, 1♂; same data except, 4-VI-2006, JA Cole, LACM, 1♂; same data except JAC, 1♀; junction Santa Rosa Rd. and US101, 34.603319, -120.284877, 14-VII-1976, CAS, 2♂; Santa Ynez Mountains, 0.8 mi. W Cold Arch Bridge on Hwy. 154, 34.528049, -119.843848, 320 m, DB Weissman, d C Lightfoot, CAS, 1♂, 1♀; Vandenberg Air Force Base, 2.7 mi. NW of intersection 13th and Airfield on 13th, 34.764161, -120.579461, 90 m, 13-VIII-1982, d B Weissman, CAS, 4♂, 1♀, CAS.

## *Aglaothorax dactyla* (Rentz & Weissman, 1981) stat. rev.

*Neduba* (*Aglaothorax*) *diminutiva dactyla*—Rentz & Weissman, 1981: 94.

*Neduba* (*Aglaothorax*) *diminutiva malibu*—Rentz & Weissman 1981: 95 **New junior subjective synonym.**

Fig. 28 (distribution), Fig. 31 (male and female habitus, calling song, male and female terminalia, karyotype), Plate 6 (male terminalia), Plate 9 (female subgenital plate), Plate 13 (male titillators), Plate 15 (male calling song).

**Common name.** Clawed Shieldback.

**History of recognition.** Described as a subspecies of *Neduba* (*Aglaothorax*) *diminutiva* from the western Santa Monica Mountains with populations to the east of Malibu Creek named *N. (A.) d. malibu* (Rentz & Weissman 1981). Transferred to *Aglaothorax* where this species is currently classified (Cigliano *et al.* 2025). The Santa Monica Mountains Diminutiva Group lineage shows strong genetic separation from other clades in the Group, especially from type *A. diminutiva*. Although we found phylogeographic separation west and east of Malibu Creek, expanded sample size negates prior morphological diagnosis of subspecies. Coupled with an absence of song and karyotype differences, we recognize *A. dactyla* at species rank and synonymize *A. d. malibu* under *A. dactyla*.

**Type material.** The holotype female of *N. (A.) d. dactyla* was collected from the junction of State Highway 23S and Mulholland Highway, Los Angeles County, California and is housed at CAS. The holotype male of *N. (A.) d. malibu* was collected at Big Rock Canyon Road 0.4 miles north of Pacific Coast Highway in Malibu, Los Angeles County, California, and is also housed at CAS. Images of the types are available at OSFO (Cigliano *et al.* 2025).

PARATYPES EXAMINED: (n=2) *dactyla* USA, CA, Los Angeles Co., Cal Hwy 23 Mulholland Hwy., 34.0873, -118.8742, 556 m, 21-VI-1971, d B Weissman, CAS, 1♀; Ventura Co., Point Mugu State Beach dune area, 34.083332, -119.050003, 4 m, 19-VII-1972, d B Weissman, CAS, 1♂; TOPOTy PES EXAMINED: (n=9); *dactyla* USA, CA, Los Angeles Co., Malibu, Eino's, corner of Mulholland and Decker (23S), 34.08855, -118.87360, 2-VII-1976, d B Weissman, CAS, 1♂; SR23S & Mulholland Hwy., 34.0873, -118.8742, 548 m, 14-VIII-1982, d B Weissman, CAS, 3♂; same data except 17-VI-2008, JA Cole, LACM, 1♂; same data except JAC, 1♀; *malibu* USA, CA, Los Angeles Co., Malibu, Big Rock Canyon Rd. at Rockport, 34.035842, -118.609528, 28-VI-1976, DB Weissman, CAS, 1♂; Malibu, intersection of Big Rock and Inland Roads, 34.035842, -118.609528, 5-VII-1982, d B Weissman, CAS, 2♂.

**Measurements.** (mm, ♂n=17, ♀n=11) Hind femur ♂13.65–16.07, ♀15.70–19.35, pronotum total length ♂8.04–9.76, ♀7.05–9.95, prozona length ♂2.90–4.19, ♀3.24–5.05, metazona dorsal length ♂4.58–5.95, ♀3.40–5.00, pronotum constriction width ♂2.25–3.05, ♀2.61–3.40, metazona dorsal width ♂5.60–6.65, ♀5.03–6.75, head width ♂3.35–3.88, ♀4.07–4.81, ovipositor length ♀11.00–14.30.

**Distribution.** Santa Monica Mountains, California.

**Habitat.** Coastal sage scrub, grassland, chaparral, oak woodland. Frequents hillsides, hilltops, and dry (south) slope chaparral. On California Sage (*Artemisia californica* Less.), Mulefat (*Baccharis* sp.), Laurel Sumac, *Ceanothus* spp., Monkeyflower, Western Sycamore, Coast Live Oak, Scrub Oak, White Sage (*Salvia leucophylla* Greene), and Poison Oak.

**Seasonal occurrence.** Spring (3-V-1997, JA Cole, LACM) through summer (24-VIII-1976, PH Sullivan, CAS). Nymphs and adults occurred alongside one another at the early date record.

**Stridulatory file.** (n=6) length 3.20–3.90 mm, 81–106 teeth, tooth density 27.8±2.7 (25.3–32.8) teeth/mm.

**Song.** (n=46) Common small *Aglaothorax* song with slowly produced pulse trains that are countable by a human listener. Pulse trains 50±20 ms in length are produced at a rate of 5.05±0.79 s<sup>-1</sup>. Mean peak frequency is 15.84±4.43 kHz, with peak frequencies as high as 26.60 kHz detected with ultrasonic recording equipment. Echemes are highly variable in length and group 36±20 (5–92) pulse trains. The echeme repetition rate is 1–12 min<sup>-1</sup>. Males are synchronous chorusers. Followers may join leaders and overlap pulse trains precisely, making it difficult to gauge the number of males singing in an area. Across distance, choruses may be heard to spread like waves as males at increasing distances join the chorus center.

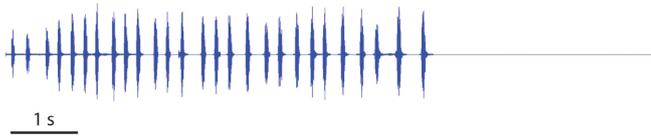
**Karyotype.** (n=3) 2n♂=24 (22t+Xty t), topotype T82-123 (S82-56).

**Recognition.** Morphology, geography. The male supra-anal plate is heart-shaped, sometimes only slightly, but the caudal margin of the plate is always indented, the paraproct processes have an internal apical tooth, and the titillator arms are long and bowed, characters that separate *A. dactyla* from Morsei Group species. Sympatric and nearby allopatric Morsei Group species have rounded supra-anal plates, a subapical tooth on the paraproct process, and short, barely curved titillator arms. The long, bowed titillators also separate *A. constrictans* from consideration,

male USA. CA: Ventura Co. JAC000002623



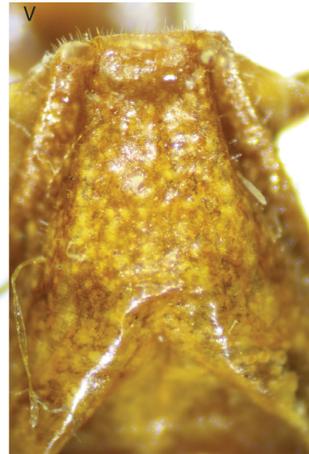
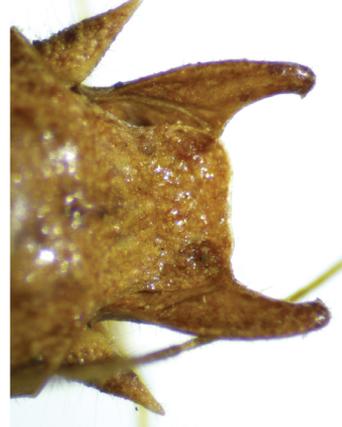
calling song TOPOTYPE USA. CA: Los Angeles Co. 25.5°C R82-249



karyotype TOPOTYPE USA. CA: Los Angeles Co. T82-123



male terminalia TOPOTYPE USA. CA: Ventura Co. JAC000002622 R



female TOPOTYPE USA. CA: Los Angeles Co. JAC000002628



titillators PARATYPE



female subgenital plate PARATYPE



male *malibu* TOPOTYPE USA. CA: Los Angeles Co. S82-34, R82-91, T82-20



male terminalia *malibu* TOPOTYPE R



male terminalia *malibu* TOPOTYPE V



FIGURE 31. *A. dactyla* male and female habitus, calling song, male and female terminalia, and karyotype. Idiogram shows karyotype  $2n\♂=24$ .

which has short titillator arms and *A. oreibates*, which has long titillators that show less lateral curvature. The female subgenital plate has the longest and most slender digitiform lateral processes of any *Aglaothorax*; the processes of *A. acrolophitus* and *A. poecilnotum* are shorter, thicker at the base, and more strongly tapered.

**Notes.** Complete syntopy of *A. dactyla* and *A. costalis* in a garden were noted in their original description, where their specific distinction was evident from obvious song differences (Rentz & Weissman 1981). We have since observed syntopy throughout the Santa Monica Mountains: both species may be found on the same plants and choruses of their divergent songs may be heard alongside one another. The history of mitochondrial capture by *A. costalis* and *A. longipennis* (Fig. 3) illustrates incomplete reproductive isolation. The contact zone between *A. dactyla* and *A. costalis* is an example of reinforcement of premating isolation. Females of both species avoid songs of heterospecifics (Cole 2016), which is made possible by evolution of a rapid pulse train rate in *A. costalis*. In addition to song, the two species show partial ecological and temporal isolation. *A. dactyla* prefers the dry upland or south facing slopes while *A. costalis* is more common in lowland, mesic, and riparian areas. Adult activity commences and ceases earlier in the season in *A. dactyla* than in *A. costalis*. East of Malibu Creek, *A. dactyla* is broadly sympatric with *A. longipennis* but that pair are more strongly separated by habitat and have not been observed in syntopy.

**Material examined.** (n=51) **All USA, CA, Los Angeles Co.,** Backbone Trailhead, at junction Stunt, Schueren, and Saddle Peak Rds., 34.0812, -118.6454, 721 m, 9-24-VI-2012, JA Cole, JAC, 2♂, 2♀; Calamigos Ranch, 34.09278, -118.81694, 550 m, 1-VII-1961, d L Gibo, CSUN, 1♀; Charmlee County Park, 34.0608, -118.8771, 427 m, 23-24-VIII-1976, PH Sullivan, CAS, 1♀; Charmlee Wilderness Park, 3.8 miles north of SR1 on Encinal Canyon Road, 34.0608, -118.8771, 427 m, 29-30-VI-2006, JA Cole, JF Eguizabal, LACM, 1♂; same data except 2-VI-2005, JA Cole, JF Eguizabal, LACM, 1♀; same data except JAC, 1♂; same data except 3-4-V-1997, JA Cole, LACM, 1♂, 1♀; Griffith Park, Mount Hollywood Trail, 34.1240, -118.3009, 370 m, 7-V-2002, JA Cole, JF Eguizabal, 1♂ sound record; junction Big Rock drive and SR1, 34.0377, -118.6088, 5 m, 17-VI-2008, JA Cole, 1♂ sound record; junction Las Flores Canyon Rd. and Schueren Rd., 34.0625, -118.6486, 469 m, 24-25-VI-2012, JA Cole, JAC, 1♂; junction Las Flores Rd. and Gorge Rd., 34.0507, -118.6391, 66 m, 25-VI-2012, JA Cole, LACM, 1♂; Leo Carrillo State Park, Nicholas Flat, at end of Decker School Rd., 34.0638, -118.9128, 457 m, 3-VI-2008, JA Cole, LACM, 1♂, 1♂ sound record; same data except 5-VI-2007, JA Cole, LACM, 1♂; same data except 8-VI-2008, JA Cole, LACM, 1♂; Topanga State Park, dead Horse Trail, 34.0915, -118.5939, 274 m, 27-28-V-2008, JA Cole, 1♂ sound record; UCLA Stunt Ranch Santa Monica Mountains Reserve, 34.0951, -118.6486, 374 m, 12-13-VI-2014, JA Cole, d A Gray, LACM, 1♂; **Ventura Co.,** Point Mugu State Park, Sycamore Canyon, 34.0728, -119.0145, 4 m, JA Cole, LACM, 7♂, 1♀; same data except 11-VI-2007, JA Cole, LACM, 1♀; same data except 14-15-VI-2007, JA Cole, 1♂ sound record; same data except JA Cole, JF Eguizabal, LACM, 1♂; same data except 16-17-VI-2008, JA Cole, LACM, 1♀; same data except JAC, 1♀; same data except 18-VI-2007, JA Cole, 1♂ sound record; same data except 2-3-VI-2008, JA Cole, LACM, 4♂; same data except JAC, 1♂; same data except 28-29-V-2007, JA Cole, 1♂ sound record; same data except 4-VI-2007, JA Cole, AMNH, 1♂, 1♀; LACM, 2♂; same data except 5-6-VI-2006, JA Cole, LACM, 3♂, 1♀; JAC, 1♂; same data except 9-VI-2005, JA Cole, LACM, 1♀.

### *Aglaothorax acrolophitus* Cole, Weissman, and Lightfoot, sp. nov.

Fig. 28 (distribution), Fig. 32 (male and female habitus, calling song, male and female terminalia, karyotype), Plate 6 (male terminalia), Plate 9 (female subgenital plate), Plate 13 (male titillators), Plate 15 (male calling song).

**Common name.** Mountaineer Shieldback.

**History of recognition.** None.

**Type material.** HOLOTYPE MALE: **USA, California, Kern County,** Tehachapi, Water Canyon Road, 0.15 miles south of intersection with Highland, 35.30774N, 118.02174W, 1463 m, 28-VIII-1983, DB Weissman, S83-115, R83-293, T83-45, 97 [stridulatory file tooth count], 3.7 [stridulatory file length, mm], excised tegmen in gelcap below specimen, deposited in CAS, Entomology type #20378. PARATYPES: (n=39) **USA, CA, Kern Co.,** Tehachapi, Water Canyon Rd., 0.15 miles S of intersection with Highline Rd., 35.307739, -118.021738, 1463 m, 28-VIII-1983, d B Weissman, CAS, 1♂; **Los Angeles Co.,** Agua Dulce Canyon, Agua Dulce Canyon Road, 2 miles south of Agua dulce, 34.4729, -118.3311, 679 m, 17-VI-2003, JA Cole, AMNH, 1♂, 1♀; same data except LACM, 5♂, 5♀; Arroyo Seco, Gabrielino Recreation Trail, end of Windsor, 34.2065, -118.1670, 355 m, 4-IX-2021, JA Cole, JF Eguizabal, LACM, 1♂; Chilao Campground, Angeles National Forest, 25 miles NE of La Canada Flintridge

on SR2 (Angeles Crest Highway), 34.3262, -118.004, 1615 m, 27-IX-1999, JA Cole, JF Eguizabal, LACM, 2♂; same data except 7-VIII-2013, JA Cole, LACM, 2♂; devil's Punchbowl County Park, 34.4138, -117.8587, 1470 m, 17-VIII-1982, d B Weissman, LACM, 1♂; end of Stonehill Way, Canyon Country, 34.4246, -118.4532, 294 m, 26-27-V-2013, JA Cole, LACM, 3♂; Forest Road 7N01 and San Francisquito Canyon Road, 34.6431, -118.3783, 1080 m, 30-31-VII-2017, JA Cole, LACM, 1♀; Placerita Nature Center, 34.382775, -118.465917, 21-XII-1982, PH Sullivan, CAS, 1♂; Templin Highway off I-5, 34.6165, -118.7439, 700 m, 29-30-VI-2006, JA Cole, JF Eguizabal, LACM, 1♀; **Ventura Co.**, McGill Campground, Los Padres National Forest, 34.81505, -119.10014, 2271 m, 8-9-VIII-2017, JA Cole, LACM, 4♂; Squaw Flat Road at trailhead to Sespe Creek, 8 miles north of Fillmore on Goodenough Road, 34.4826, -118.9179, 799 m, 11-VII-2021, JA Cole, AMNH, 1♂; same data except LACM, 3♂, 2♀; same data except 3-4-VII-2012, JA Cole, LACM, 4♂;

**Measurements.** (mm, ♂n=13, ♀n=11) Hind femur ♂11.80–14.17, ♀13.25–17.05, pronotum total length ♂6.50–9.04, ♀5.95–8.30, prozona length ♂2.75–4.04, ♀2.73–4.91, metazona dorsal length ♂3.60–5.55, ♀3.10–4.54, pronotum constriction width ♂2.40–3.00, ♀2.60–3.80, metazona dorsal width ♂4.89–6.16, ♀4.40–5.90, head width ♂3.44–4.20, ♀3.77–4.75, ovipositor length ♀9.95–13.37.

**Distribution.** Northern Transverse Ranges of California. Populations span a considerable west-east distance from the San Emigdio Mountains in the west to the Tecachapi Mountains in the east and apparently north into the southern Sierra Nevada.

**Habitat.** Chaparral and mixed woodland. Prefers thick tangles of vegetation. On Manzanita, *Ceanothus* spp., Chaparral Yucca (*Hesperoyucca whipplei* (Torr.) A. Baker), and Peruvian Pepper Tree (*Schinus molle* L.). May occur in exurban developments that encroach upon native habitat e.g. in Canyon Country, Los Angeles County, California.

**Seasonal occurrence.** Adult activity from spring (26-V-2013, JA Cole, LACM) into winter (21-XII-1972, PH Sullivan, CAS). Nymphs were common 17-VI-2003 (JA Cole, LACM).

**Stridulatory file.** (n=13) length 2.70–3.70 mm, 76–98 teeth, tooth density  $29.5 \pm 3.2$  (23.8–35.9) teeth/mm.

**Song.** (n=30) Common small *Aglaothorax* song type with a slow pulse train rate. Pulse trains  $60 \pm 20$  ms are produced at a rate of  $5.25 \pm 0.70$  s<sup>-1</sup>. Mean peak frequency is  $14.08 \pm 1.31$  kHz. Variable length echemes contain a large number of pulse trains, on average  $31 \pm 16$  (range 8–78) pulse trains. The echeme repetition rate is 6 min<sup>-1</sup>.

**Karyotype.** (n=4)  $2n \text{♂} = 24$  (22t+Xty t), holotype T83-45 (S83-115).

**Recognition.** Morphology, geography. Male supra-anal plate heart-shaped, paraproct with apical internal tooth, and titillators long and strongly bowed, excluding the Morsei Group that possesses in most species a subapical internal tooth on the male paraproct arm, a rounded or square supra-anal plate, and short titillator arms. Male *A. constrictans* also have a heart-shaped supra-anal plate but have short titillator arms. Male *A. oreibates* have titillator arms with less lateral curvature and a basal constriction. Female subgenital plate with long digitiform processes unlike the short, triangular processes of Morsei Group species and *A. constrictans*. The *A. acrolophitus* female subgenital plate lateral processes are stout at the base and taper to a blunt apex unlike the sharp, slender processes of female *A. dactyla*. The inner margins of the female subgenital plate processes met in a rounded angle in *A. acrolophitus* but at a right angle in *A. diminutiva*. Males of *A. dactyla* and both males and females of *A. poecilnotum* may be morphologically indistinguishable but are geographically separated in the Santa Monica and Santa Ynez Mountains, respectively.

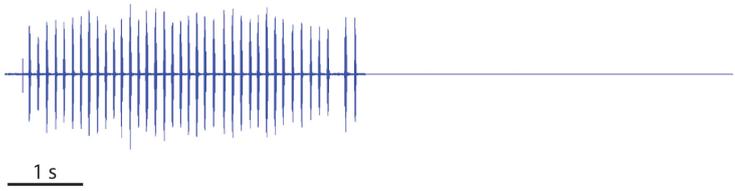
**Etymology.** *Gr. acrolophitus* a mountaineer. Inspired by the wide distribution across the Transverse Ranges of California.

**Notes.** Populations that belong to this species are distributed across a wide geographic range (Fig. 27). This is the only small *Aglaothorax* that enters the Sierra Nevada Mountains, where *Neduba* spp. replace *Aglaothorax* in chaparral and mixed woodland habitats (Cole *et al.* 2021). Adult activity and nymphal development may overlap by several weeks. At Agua Dulce Canyon, Los Angeles County, nymphs and adults were common feeding on the stalks and fruits of chaparral yucca. A parasitoid *Ormia* fly emerged 8-VI-2013 from a male collected from a northern Los Angeles County exurban habitat in Canyon Country on 26-27-V-2013. The introgression of *A. acrolophitus* mtDNA into both *A. conistylus* and *A. morsei* has occurred along regions of sympatry in the San Gabriel Mountains. In areas of overlap *A. acrolophitus* was apparently rare. JAC collected large series of *A. morsei* for female preference testing several times at Arroyo Seco, Gabrieleño Recreation Trail, Los Angeles County, California. On only one occasion, 3-IX-2021, was a male of *A. acrolophitus* captured.

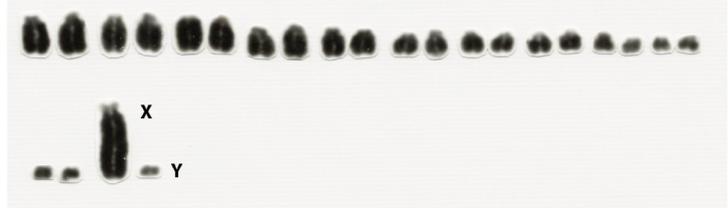
male HOLOTYPE USA. CA: Kern Co.  
S83-115, R83-293, T83-45



calling song PARATOPOTYPE USA. CA: Kern Co. 21.0°C R83-292



karyotype HOLOTYPE USA. CA: Kern Co. S83-115, T83-45



male terminalia HOLOTYPE USA. CA: Kern Co. S83-115  
R V



female PARATYPE USA. CA: Los Angeles Co.  
JCR000002592



titillators PARATYPE USA. CA:  
Ventura Co. JAC000002576



female subgenital plate PARATYPE  
CA: Los Angeles Co. JAC000002587



male PARATYPE USA. CA: Los Angeles Co.  
JCR000002940



**FIGURE 32.** *A. acrolophitus* male and female habitus, calling song, male and female terminalia, and karyotype. Idiogram shows karyotype  $2n_{\text{♂}}=24$ .

**Material examined.** (n=7) **All USA, CA, Kern Co.**, Water Canyon Road, 1.4 miles below entrance to Tehachapi Mountain Park, 35.08258, -118.49486, 1571 m, 20-VII-2015, JA Cole, dB Weissman, JAC, 1♂; **Los Angeles Co.**, Clear Creek, San Gabriel Mountains, 34.288893, -117.646722, 1113 m, 15-VII-1970, RH Crandall, LACM, 1♂; county road N4, 3 miles east of Big Rock Springs, 34.4264, -117.8078, 1407 m, 7-VII-2004, JA Cole, LACM, 1♂; same data except 8-VII-2004, JA Cole, LACM, 1♂; Devil's Punchbowl County Park, 34.4138, -117.8587, 1470 m, 3-4-VIII-1974, PH Sullivan, CAS, 1♀; Templin Highway and FR6N53, 34.5858, -118.7142, 899 m, 16-VI-2012, JA Cole, 1♂ sound record; **Ventura Co.**, Pine Mountain Summit, 34.634152, -119.28817, 2027 m, 4-IX-1983, no collector, LACM, 1♂. **QUESTIONABLE PLACEMENT:** (n=8) **USA, CA, Los Angeles Co.**, Altadena, 34.189728, -118.131182, 1080 m, 29-VI-1989, RH Crandall, taken by sphecid, LACM, 1♀; Arroyo Seco, Gabrielino Recreation Trail, end of Windsor, 34.2065, -118.16700, 355 m, 17-IV-2017, JA Cole, K Halsey, JAC, 1♂ nymph; Bouquet Canyon, 34.425829, -118.541475, 700 m, 23-VII-1937, N Westerland, LACM, 1♂; Juniper Hills, Devil's Punchbowl Road (County Road N6), 2 miles east of Longview Road, 34.4267, -117.8697, 1316 m, 14-VI-2015, JA Cole, GE Bell, T Farwell, JAC, 1♂ nymph; San Gabriel Mountains, Big Tujunga Canyon near Fusier Canyon, 34.281, -118.211, 700 m, 2-V-2015, K Singh, malaise trap, CSUN, 2♀ nymphs; Sierra Highway, 0.5 miles west of Boiling Point, 34.5174, -118.2713, 920 m, 17-VI-2003, JA Cole, 1♂ song recording; **Tulare Co.**, Sierra Nevada, Sequoia Nat. For., Greenhorn Mts., Camp Nelson, 36.142724, -118.609256, 1525 m, 14-VIII-1982, SL Gibson, 1♂.

### *Aglaothorax oreibates* Cole, Weissman, and Lightfoot, sp. nov.

Fig. 28 (distribution), Fig. 33 (male and female habitus, calling song, male and female terminalia, karyotype), Plate 6 (male terminalia), Plate 9 (female subgenital plate), Plate 13 (male titillators), Plate 15 (male calling song).

**Common name.** Ventura Shieldback.

**History of recognition.** None.

**Type material.** HOLOTYPE MALE: **USA, California, Ventura County**, Highway 33, 34.51633N, 119.27758W, 649 m, 11-VII-2018, DB & DW Weissman, S18-26, R19-17, T19-11, D175, SING1000 [DNA extraction], MLNS Catalog # R19-017 [sound archive], 8444746 [specimen barcode], deposited in CAS, Entomology type #20380. PARATYPES: (n=14) **USA, CA, Ventura Co.**, same data as holotype, CAS, 4♂, 1♀; Harmon Canyon, 948 Scenic Way Drive, Ventura, 34.29458, -119.20121, 219 m, 23-V-2016, JA Cole, AMNH, 1♂; same data except LACM, 3♂, 1♀; same data except, JAC, 1♂; Wheeler Gorge Camp, 34.51824, -119.27108, 1870 m, 11-VII-2018, dB & dW Weissman, CAS, 3♀.

**Measurements.** (mm, ♂n=6, ♀n=5) Hind femur ♂15.45–17.31, ♀15.15–18.64, pronotum total length ♂9.24–10.91, ♀7.44–9.25, prozona length ♂3.85–4.51, ♀3.88–5.24, metazona dorsal length ♂5.08–6.41, ♀3.15–4.01, pronotum constriction width ♂2.85–3.57, ♀2.85–3.35, metazona dorsal width ♂6.51–7.43, ♀5.01–6.37, head width ♂4.10–4.40, ♀4.18–4.83, ovipositor length ♀10.75–14.00.

**Distribution.** Western Transverse Ranges of California.

**Habitat.** Coastal sage scrub and chaparral, including exurban areas adjacent to natural habitat.

**Seasonal occurrence.** Scant records show a long season with spring (23-V-2016, JA Cole, LACM) through fall (18-X-2020, A. Abela, LACM) adult activity.

**Stridulatory file.** (n=2) length 3.8 mm, 98–101 teeth, tooth density 26.2±0.6 (25.8–26.6) teeth/mm.

**Song.** (n=8) Typical small *Aglaothorax* song with widely spaced pulse trains produced slowly enough to count. Pulse trains 60±20 ms in length are produced at a rate of 5.14±0.34 s<sup>-1</sup>. Mean peak frequency is 11.91±0.86 kHz. Variable length echemes contain 19–42 (mean 28±7) pulse trains. Silent intervals between echemes are brief and last 12±3 (range 5–16) s.

**Karyotype.** (n=5) 2n♂=24 (22t+Xty t), paratopotype T19-5 (S18-26).

**Recognition.** Morphology, DNA, geography. Body size averages large for the Diminutiva Group. The heart-shaped male supra-anal plate and apical mesal tooth on the male paraproct processes separate most Morsei Group species. The long titillator arms, characteristic of the Diminutiva Group in general, serve to eliminate *A. constrictans* and Morsei Group species, which possesses short titillator arms. The gentle lateral curve and narrowed base of the titillators separate this species from *A. dactyla*, *A. diminutiva*, and *A. poecilonotum*, which have strongly curved titillator arms without a basal constriction. The female subgenital plate of *A. oreibates* has lateral processes that are

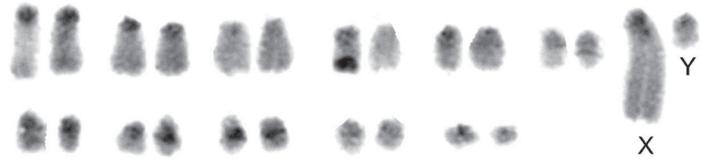
male HOLOTYPE USA. CA: Ventura Co.  
CAS8444746



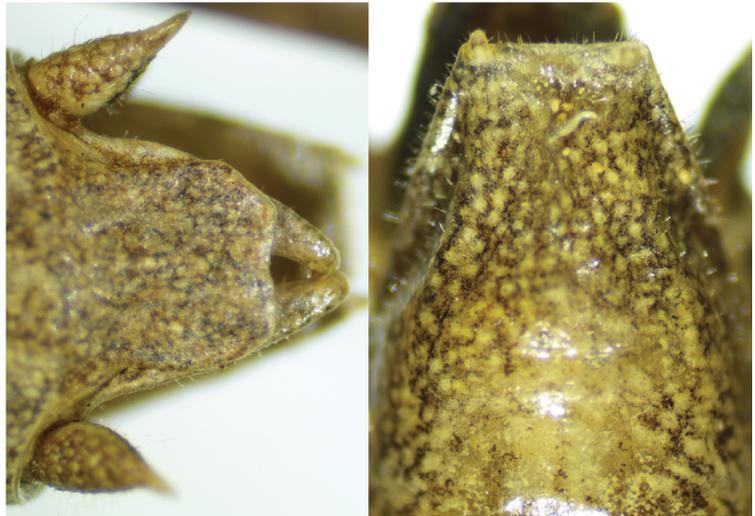
calling song PARATOPOTYPE USA. CA: Ventura Co. 21.3°C  
S18-26, R19-15



karyotype PARATOPOTYPE USA. CA: Ventura Co. S18-26, T19-5



male terminalia HOLOTYPE USA. CA: Ventura Co. CAS8444746  
R V



female PARATYPE  
USA. CA: Ventura Co. JAC000002644



male PARATYPE  
USA. CA: Ventura Co. JAC000002641



titillators PARATOPOTYPE USA. CA: Ventura Co. CAS8444737



female subgenital plate PARATYPE  
JAC000002644

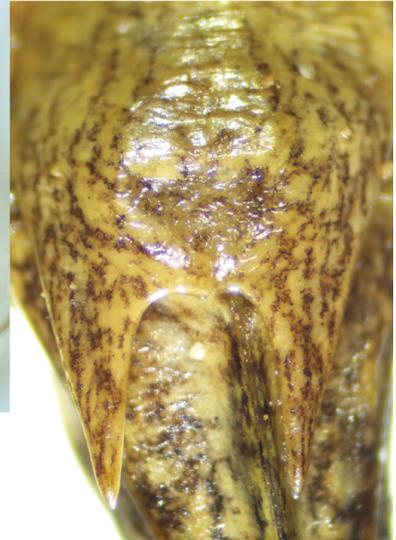


FIGURE 33. *A. oreibates* male and female habitus, calling song, male and female terminalia, and karyotype. Idiogram shows karyotype  $2n\sigma=24$ .

of moderate length, thick at the base and tapered to a blunt apex. This condition eliminates *A. dactyla* in which females have longer, narrower, and sharper lateral processes. The lateral processes meet the subgenital plate caudal margin at a curve, unlike the right angle of *A. diminutiva*. Females may be morphologically indistinguishable from those of *A. acrolophitus* and *A. poecilonotum*, but *A. oreibates* is not known from the north slope of the Transverse Ranges or the Santa Ynez Mountains.

**Etymology.** Gr. *ore* a mountain + *bates* one that walks or haunts.

**Notes.** The type series were raised from eggs laid by two wild caught females collected on oatmeal trails on 11-VII-2018 from S18-26 and S18-28, and treated as described on p. 6. From 21-VII until 17-VIII, they laid some 15–20 eggs which were kept at room temperature, in moist soil, until 29-X-2018, and then refrigerated at 3°C where they remained until 15-III-2019, when they were returned to room temperature. First hatching occurred on 2-IV-2019 with 12 eggs total hatching by 22-IV-2019. The first adults appeared 10-VI-2019.

**Material examined.** In addition to Type Material above, USA, CA, Ventura Co., Lockwood Valley, 34.732482, -119.042048, 18-X-2020, A Abela, LACM, 1♀.

### *Aglaothorax poecilonotum* Cole, Weissman, and Lightfoot, sp. nov.

Fig. 28 (distribution), Fig. 34 (male and female habitus, calling song, male and female terminalia, karyotype), Plate 6 (male terminalia), Plate 9 (female subgenital plate), Plate 13 (male titillators), Plate 15 (male calling song).

**Common name.** Santa Ynez Shieldback.

**History of recognition.** None.

**Type material.** HOLOTYPE MALE: USA, California, Santa Barbara County, Upper Oso Campground, Los Padres National Forest, 34.55469N, 119.76960W, 349 m, 10-VIII-2021, DB & DW Weissman, S21-22, R22-8, F1 [reared], deposited in CAS, Entomology type #20379. PARATOPOTYPES (n=45) USA, CA, Santa Barbara Co., same data as holotype, CAS, 6♂, 21♀; Upper Oso Campground, Los Padres National Forest, 22 miles northwest of Santa Barbara off SR154 (Paradise Rd.), 34.5544, -119.7683, 376 m, 11-12-VI-2008, JA Cole, LACM, 10♂; same data except 7-8-VI-2002, JA Cole, AMNH, 2♂; same data except LACM, 5♂, 1♀.

**Measurements.** (mm, ♂n=6, ♀n=5) Hind femur ♂12.13–14.43, ♀13.65–16.55, pronotum total length ♂6.85–8.59, ♀6.47–8.38, prozona length ♂3.15–4.20, ♀3.26–4.79, metazona dorsal length ♂3.55–5.05, ♀2.60–4.18, pronotum constriction width ♂2.36–2.80, ♀2.50–3.40, metazona dorsal width ♂5.10–6.11, ♀4.60–6.15, head width ♂3.41–3.90, ♀3.77–4.41, ovipositor length ♀10.34–11.83.

**Distribution.** Santa Ynez Mountains of Santa Barbara County, California.

**Habitat.** Oak woodland understory and riparian. On *Ceanothus* spp., Scrub Oak, and Sage (*Salvia* spp.).

**Seasonal occurrence.** Adult activity from late spring (7-VI-2002, JA Cole, LACM) through summer (10-VIII-2021, DB Weissman, CAS). A captive reared nymph matured on 30-IV, which may be earlier than during a typical season in nature.

**Stridulatory file.** (n=5) length 2.9–3.5 mm, 88–103 teeth, tooth density 30.3±4.2 (25.7–35.5) teeth/mm.

**Song.** (n=5) Common song type of small *Aglaothorax*. Pulse trains of length 40 ms are repeated at a rate of 4.42±0.45 s<sup>-1</sup>. Mean peak frequency is 18.74±3.02 kHz; high frequency recording equipment places the peak frequency within the ultrasonic at 22.80 kHz. Echemes are variable in length and contain 11–40 (mean 26±11) pulse trains. Silent intervals between echemes are brief at 8±4 s (range 5–12.5 s). At the type locality males were first heard singing at 2100 h and peak acoustical activity began after 2330 h.

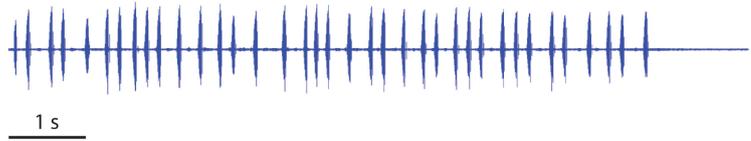
**Karyotype.** (n=3) 2n♂=24 (22t+Xty t) paratype T21-18 (S21-22).

**Recognition.** Morphology, geography. The male paraproct process has an apical mesal tooth unlike the generally subapical tooth of most Morsei Group species. The male titillator is long and bowed, unlike the short slightly curved titillator arm of *A. constrictans* and the morse Group. The strong lateral curve to the titillator and lack of a basal constriction on the titillator arms together eliminate *A. oreibates* from consideration, which has less lateral curvature and a basal constriction. The *A. poecilonotum* female subgenital plate has digitiform lateral processes that are broad at base and rather blunt at the apex, unlike the long, narrow, and sharp processes of *A. dactyla*. The *A. poecilonotum* subgenital plate lateral processes round onto the caudal margin of the plate unlike the right angle observed in female *A. diminutiva*. Female *A. poecilonotum* may be morphologically indistinguishable from those of *A. acrolophitus* and *A. oreibates*. The range of *A. poecilonotum* is restricted to the Santa Ynez Mountains.

male HOLOTYPE USA. CA: Santa Barbara Co. S21-22, R22-8



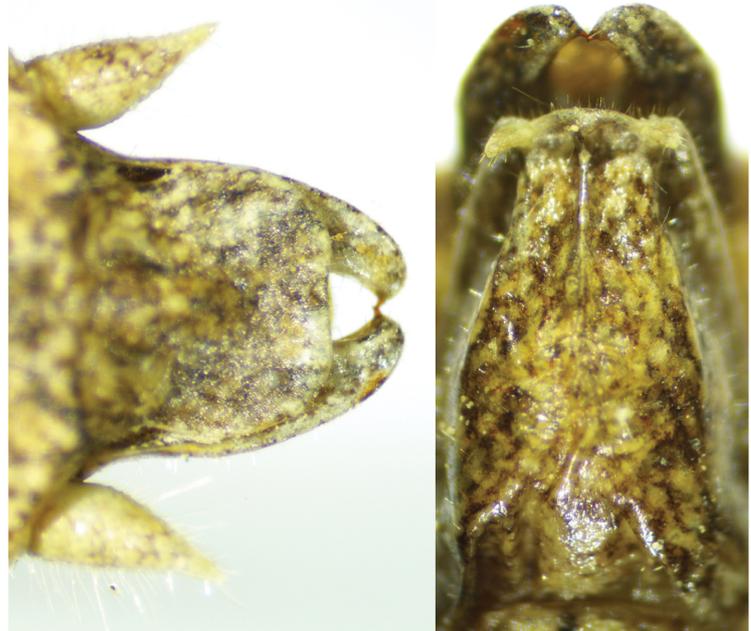
calling song PARATOPOTYPE USA. CA: Santa Barbara Co. 24.5°C JCR08U001



karyotype PARATOPOTYPE USA. CA: Santa Barbara Co. S21-22, T21-18



male terminalia HOLOTYPE USA. CA: Santa Barbara Co. S21-22 R V



female PARATOPOTYPE USA. CA: Santa Barbara Co. S21-22



titillators PARATOPOTYPE JAC000002611



female subgenital plate PARATOPOTYPE S21-22



male PARATOPOTYPE USA. CA: Santa Barbara Co. JAC000002603



FIGURE 34. *A. poecilnotum* male and female habitus, calling song, male and female terminalia, and karyotype. Idiogram shows karyotype  $2n_{\text{♂}}=24$ .

**Etymology.** Gr. *poecilo* variegated, many colored + *notum* the back. Descriptive of the variable color patterns exhibited among individuals, of which one of the color patterns is also variegated.

**Notes.** There was little singing when the type series was collected on 10-VIII-2021 (S21-22), but many adult females and two adult males were attracted to a long oatmeal trail. Five field-collected adult females were housed together at room temperature as described on p. 6 starting on 10-VIII-2021. On 28-IX-2021, the sand was examined for eggs and a total of 30 were harvested. All eggs were kept at room temperature (between 15–25°C) and natural photoperiod until hatching commenced on 4-I-2022. Between 4-I-2022 and 30-I-2022, a total of 17 eggs hatched. The 13 unhatched eggs were continued at room temperature until they were chilled at 3°C from 3-IX-2022 to 6-III-2023, before being returned to room temperature and natural photoperiod. Between 6-III-2023 and 25-III-2023, another eight eggs hatched, for a total of 25 out of 30 eggs successfully hatched.

**Material examined.** See Type Material above.

**Diminutiva Group populations that need further study.** A single male with full metadata from Pico Canyon, Newhall Ranch, Los Angeles County, California, has long bowed titillaors consistent with the Diminutiva Group, sings with the standard 5 s<sup>-1</sup> pulse train rate, and exhibits mitonuclear conflict: nDNA groups this individual with *A. longipennis* + *A. amathitis* while mtDNA falls outside of both small *Aglaothorax* clades. An expanded sample size is required to arrive at a diagnosis given the character conflict in this population. The population may have hybrid characteristics as in the nearby Santa Monica Mountains. A collection of malaise trap samples from the Santa Susana Mountains is morphologically a member of the Diminutiva Group and occupies a locality in the vicinity of both *A. acrolophitus* and *A. dactyla*. Without song or DNA data, we withhold placing this population to species.

**Material examined.** (n=12) USA, CA, Los Angeles Co., Pico Canyon, 2 miles west of Newhall, 34.37740, -118.58448, 438 m, 11-XI-2023, J Bailey, LACM, 1♂; same data except 34.384720, -118.566078, 26-VI-1969, J Lyon, LACM, 1♂; Santa Susana Mountains, dry tributary of Browns Canyon, 34.289, -118.594, 390 m, 12-V-2-VI-2022, RW Cohen, malaise trap, CSUN, 1♂, 1♀; same data except 19-IV-12-V-2022, 2♂, 1♀; same data except 2-23-VI-2022, 1♀; same data except 23-VI-19-VII-2022, 1♂; same data except 24-V-28-VI-2023, 1♀; same data except 7-VIII-14-IX-2023, 2♂.