

Aglaothorax morsei (Caudell, 1907)

Neduba morsei—Caudell, 1907: 301.

Neduba (Aglaothorax) morsei—Rentz & Birchim, 1968: 61 (A change in status).

Fig. 15 (distribution), Fig. 16 (male and female habitus, calling song, male and female terminalia, karyotype), Plate 5 (male terminalia), Plate 8 (female subgenital plate), Plate 11 (male titillators), Plate 14 (male calling song).

Common name. Morse's Shieldback

History of recognition. Described in *Neduba* (Caudell 1907). Transferred to *Neduba (Aglaothorax)* (Rentz & Birchim 1968). Five subspecies were described from the California Channel Islands and adjacent mainland: *A. m. costalis*, *curtatus*, *islandica*, *santacruzae*, and *tectinota* (Rentz & Weissman 1981). All *morsei* subspecies were reassigned to *Aglaothorax* (Rentz & Colless 1990) where this species remains classified (Cigliano *et al.* 2025). *A. morsei* was separated from *A. diminutiva* by the subapical condition of the mesal tooth on the male paraproct (Rentz & Weissman 1981). Our results show that the position of this tooth is largely but not completely consistent between the Morsei Group and Diminutiva Group clades. Phylogenetically, the subspecies mentioned above are not conspecific with *A. morsei*, and they are variously elevated to full species or synonymized under *A. costalis* in this work (see *A. costalis* species account below, p. 43). Yet other populations represent new species described herein. We consider a record from Flagstaff, Coconino County, Arizona (Rentz & Birchim 1968) as erroneous because during our extensive years of collecting in Arizona, we have never encountered this easily recognized song.

Type material. The holotype male in ANSP is from Mount Wilson, Los Angeles County, California (Caudell 1907). Drawings of the damaged holotype were published in Rentz & Weissman (1981). TOPOTYPES EXAMINED: (n=3) USA, CA, Los Angeles Co., Eaton Canyon Park, 34.180561, -118.095903, 29-VI-1964, PH Sullivan, CAS, 1♂; Eaton Canyon Wash, Pasadena, 34.16224, -118.08500, 16-VII-1964, RH Crandall, CAS, 1♂; Henninger Flats Road, 34.192505, -118.087569, 1067 m, 15-VIII-1982, d B Weissman, CAS, 1♂.

Measurements. (mm, ♂n=7, ♀n=6) Hind femur ♂14.15–16.90, ♀16.84–18.04, pronotum total length ♂7.65–10.25, ♀7.62–8.84, prozona length ♂3.50–4.10, ♀0.18–4.34, metazona dorsal length ♂4.11–6.45, ♀3.66–7.83, pronotum constriction width ♂2.55–3.55, ♀2.93–3.30, metazona dorsal width ♂5.60–7.17, ♀5.65–6.17, head width ♂3.65–4.40, ♀4.50–5.63, ovipositor length ♀11.89–13.72.

Distribution. South slope of the San Gabriel Mountains of Southern California.

Habitat. Coastal sage scrub, oak woodland, and riparian habitats. Taken from Pacific Madrone (*Arbutus menziesii* Pursh), Monkeyflower (*Diplacus* spp.), Whorl-leaved Penstemon (*Keckiella* sp.), Laurel Sumac (*Malosma laurina* (Nutt.) Nutt. ex Abrams), *Phacelia* spp., Wild Currants (*Ribes* spp.), Elderberry (*Sambucus* sp.), Poison Oak (*Toxicodendron diversilobum* (Torr. & A. Gray) Greene), and Canyon Sunflower (*Venegasia carpesioides* DC.).

Seasonal occurrence. Adult activity from late spring (6-VI-2007, JA Cole, LACM) through winter (9-XII-2003, JN Hogue, CSUN). Nymphs in spring (12-IV-2017, JA Cole & K Halsey, LACM) through early summer (14-VI-2007, JA Cole & JF Eguizabal, LACM).

Stridulatory file. (n=7) length 3.10–4.20 mm, 89–109 teeth, tooth density 27.2±1.3 (25.8–28.9) teeth/mm.

Song. (n=35) Typical song structure for small *Aglaothorax* that sounds slow to the human ear with countable pulse trains. Pulse trains of 50±10 ms duration are delivered at a rate of 5.43±1.18 s⁻¹. Mean peak frequency is 17.16±3.15 kHz, and borders on the ultrasonic at 20.10 kHz in recordings with high frequency equipment. Pulse trains are grouped into irregular length echemes that consist of 4–24 (mean 12±5) pulse trains. The echeme repetition rate is 3–8 min⁻¹. At topotype locality S82-58 above Eaton Canyon, males were calling frequently even at 0500 h on 15-VIII-1982, and only stopped at daybreak.

Karyotype. (n=2) 2n♂=24 (22t+Xty t), topotype T82-115 (S82-58).

TABLE 3. Comparative chaetotaxy of the Morsei Group.

species	n	fore-femur 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 dorso- anterior margin	midtibia dorso- posterior margin	midtibia ventro- anterior margin	midtibia ventro- posterior margin
<i>morsei</i>	7	1-4	1	6	6	2-3	1-3	2-3	6-8	2-3	6-8	6-8
♀	6	3-4	1	6-7	6	2-4	2-3	2-3	7	2-3	7	6-7
<i>costalis</i>	17	1-5	0-1	6	5-6	2-5	1-3	1-4	6-9	1-4	6-9	5-7
♀	14	1-6	0-1	6	5-7	2-5	2-3	2-3	7-8	2-3	7-8	6-7
<i>longipennis</i>	14	1-5	0-1	5-6	6	1-3	2-3	2-3	6-7	2-3	6-7	6-7
♀	6	0-5	0-1	6	5-6	0-3	1-3	2-3	6-7	2-3	6-7	5-7
<i>amathiitis</i>	12	1-4	0-1	6	6	1-6	1-3	2-3	5-7	2-3	5-7	6-7
♀	11	1-5	0-1	6	6	3-5	2-3	3	7	3	7	6-7
<i>islandica</i>	8	1-4	0	6	6	1-3	1-3	1-3	7	1-3	7	6-7
♀	8	2-4	0-1	6	5-6	2-3	1-3	1-3	7-8	1-3	7-8	6-7
<i>hulodomus</i>	9	1-4	1	6	6	0-4	2-3	1-3	6-8	1-3	6-8	5-6
♀	6	2-4	1	5-6	6	2-3	1-3	3-4	7	3-4	7	6-7
<i>conistylus</i>	7	2-5	1	6-7	6-7	2-3	2-4	3	6-7	3	6-7	6-7
♀	3	4-5	1	6	6	2-4	2-4	3-5	7	3-5	7	6-7
<i>nesiazo</i>	9	1-4	1	6-7	5-6	0-3	1-3	1-3	6-7	1-3	6-7	5-7
♀	7	2-3	1	5-6	6	1-2	2-3	2-3	6-7	2-3	6-7	6-7
<i>bufonoides</i>	10	1-3	0-1	6	6	1-3	2-3	1-4	6-7	1-4	6-7	6-7
♀	5	3-4	0-1	6	6	2-3	1-4	2-3	7	2-3	7	6-7
<i>kelainops</i>	11	2-4	1	6-7	6	1-3	2-3	3	6-7	3	6-7	6-7
♀	6	2-4	1	5-6	5-6	0-3	2-3	2-3	6-8	2-3	6-8	6-7
<i>sphenosternum</i>	7	2-4	1	6-7	6	2-4	3-5	2-4	6-7	2-4	6-7	6-7
♀	1	4	1	6	6	3	3	3	7	3	7	6

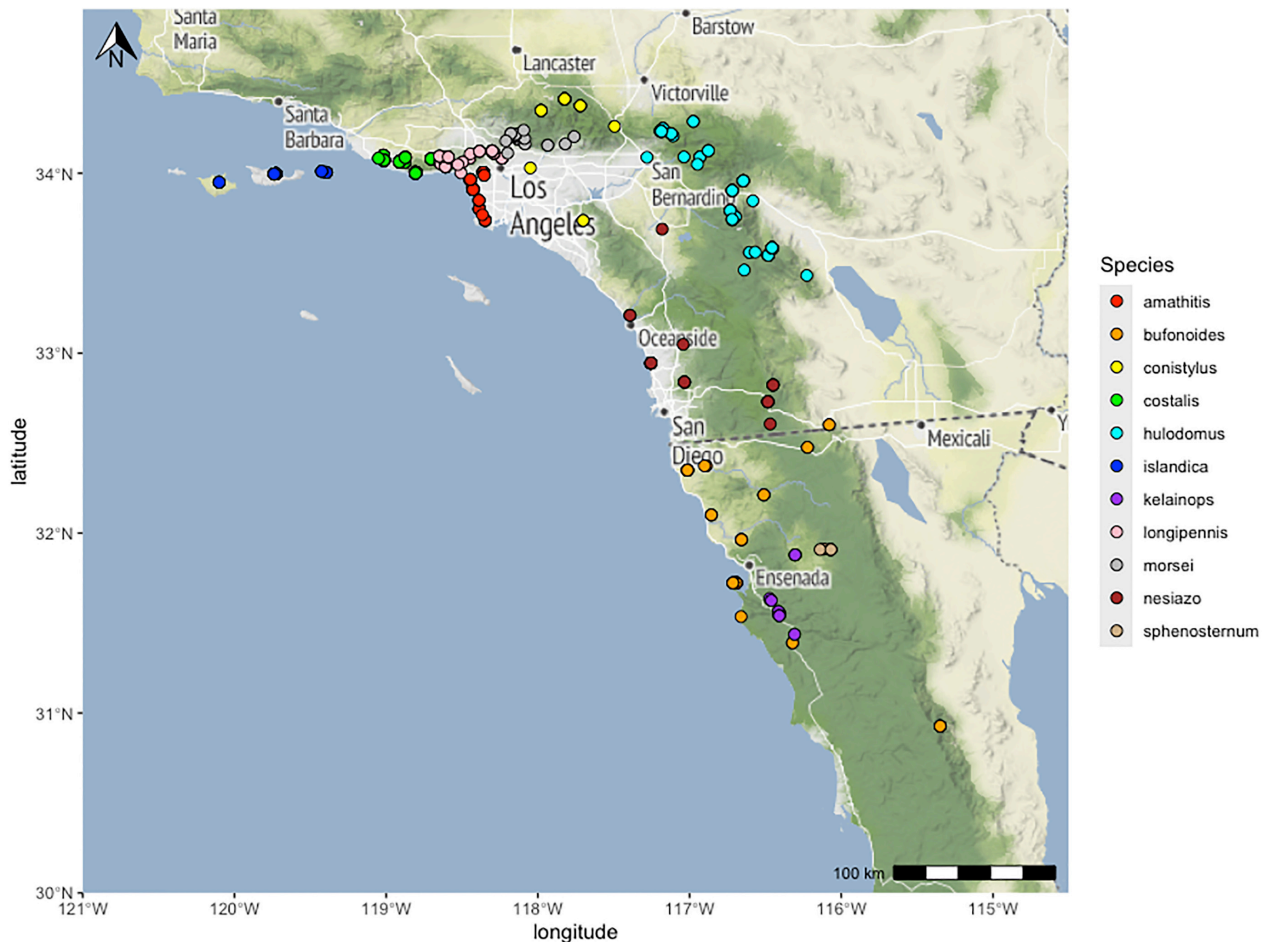


FIGURE 15. Distribution of Morsei Group species.

Recognition. Morphology, geography. The mesal tooth on the male paraproct process is positioned before the apex and the subgenital plate is flat and rounded or square with rounded edges, unlike Diminutiva Group species which have the mesal tooth apical and the supra-anal plate heart-shaped or indented on the caudal margin. The length of the paraproct process is short, as long as wide to about two times as long as wide, eliminating *A. nesiazio* from consideration as well as *A. conistylus*, which also has thick, cone-shaped styli on the male subgenital plate. *A. costalis* has short paraproct process about as long as wide, but the supra-anal plate is concave dorsally. The tooth is positioned closer to the apex of the paraproct process in *A. morsei* than in *A. hulodomus*. The male titillator arms are short, curved, have a mesal notch at the base; no other Morsei Group species has notched titillator arms, and the titillator arms of *A. hulodomus* and *A. nesiazio* are nearly straight. Most Diminutiva Group species have long, bowed titillator arms, although notably among this Group *A. constrictans* has short titillators that are notched at the base. The female subgenital plate lateral processes are triangular and usually as long as wide, never digitiform as in co-distributed Diminutiva Group species.

Notes. This species is common in the understory of riparian areas, mixed woodland, and on thickly vegetated hillsides. *A. morsei* may be sympatric with *A. acrolophitus* of the Diminutiva Group but the two are separated by habitat: mesic and xerophytic, respectively. The western boundary of the range of *A. morsei* corresponds with a recognized Transverse Range biogeographic break (Chatzimanolis & Caterino 2007), and is replaced by *A. longipennis* to the west of that break. To the east *A. morsei* is replaced by *A. conistylus* in xeric mountain habitats of the eastern San Gabriel Mountains and the surrounding lowlands, and by *A. hulodomus* in the San Bernardino Mountains. Wayward mtDNA (Fig. 3) may reflect gene flow between the aforementioned lineages.

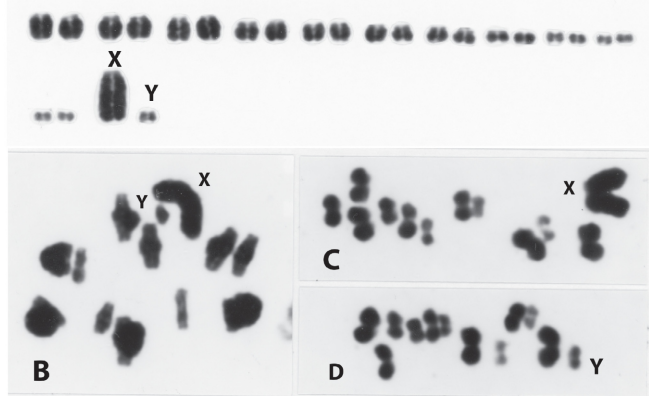
male TOPOTYPE USA. CA: Los Angeles Co. S82-57



calling song TOPOTYPE USA. CA: Los Angeles Co. 25.0°C R82-218



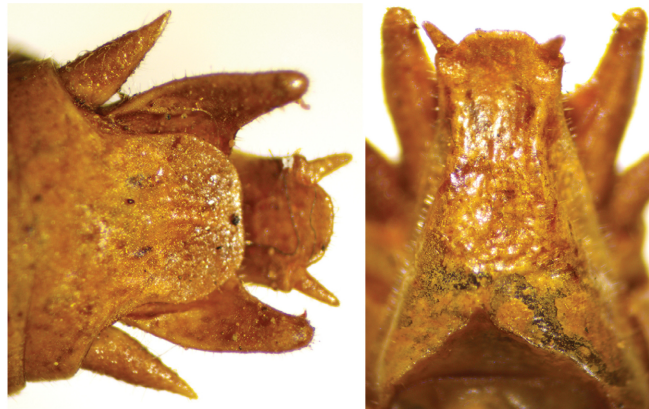
karyotype TOPOTYPE USA. CA: Los Angeles Co. S82-58, T82-115



female USA. CA: Los Angeles Co. JAC000002951



male terminalia USA. CA: Los Angeles Co. JAC000002949
R V



male USA. CA: Los Angeles Co. JAC000002930



titillators USA. CA: Los Angeles Co. JAC000002949 female subgenital plate USA. CA: Los Angeles Co. JAC000002948

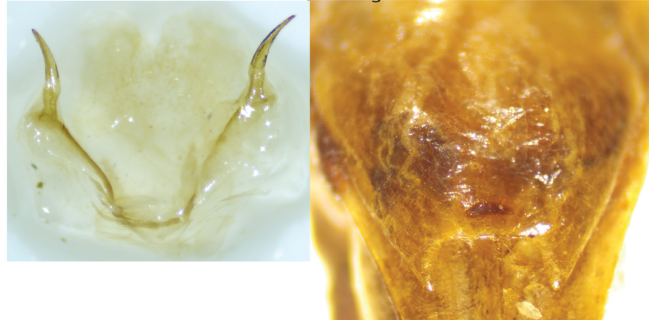


FIGURE 16. *A. morsei* male and female habitus, calling song, male and female terminalia, and karyotype. Idiogram top panel shows karyotype $2n\sigma=24$; B. Metaphase I plate showing associated X and y chromosomes, which ensures proper segregation to opposite poles; C and D showing metaphase II cells with X chromosome in C and Y chromosome in D.

A variety of color patterns may be observed in a single locality, helping individuals blend in with the visually complex backgrounds of the leaf litter and understory vegetation. As with *Neduba* (Cole *et al.* 2021), a hypothesis of the color pattern diversity is apostatic selection, during which visual predators reduce the numbers of the most common color morph until that morph becomes rare, whereupon predators switch to a new common morph while the original target increases in frequency (Bond & Kamil 1998, 2002). Apostatic patterns may have simple genetic mechanisms and may evolve rapidly and repeatedly, leading to color pattern convergence (Nosil *et al.* 2018; Villoutreix *et al.* 2023).

Material examined. (n=55) **All USA, CA, Los Angeles Co.**, Fish Canyon Trailhead, Duarte, 34.15554, -117.93524, 236 m, 17-VI-2015, JA Cole, GE Bell, y Tiemsanjai, S Tipyatabiankarn, LACM, 2♀; Los Angeles Co., Altadena, 34.189728, -118.131182, 1080 m, 10-VIII-1981, RH Crandall, LACM, 1♀; same data except 11-VI-1989, RH Crandall, LACM, 1♂; same data except, 6-VI-1990, RH Crandall, LACM, 1♂; Arroyo Seco along Gabrielino Recreation Trail, Angeles National Forest, end of Windsor Boulevard, Altadena, 34.2065, -118.1670, 355 m, 24-VI-2007, JA Cole, JF Eguizabal, AMNH, 1♂, 1♀; same data except LACM, 3♂, 1♀; same data except 3-IX-2021, JA Cole, JF Eguizabal, LACM, 1♂; same data except 7-VI-2007, JA Cole, JM Hogue, MFJ Storc, LACM, 2♂, 4♀; same data except JAC, 1♀; Big d alton Canyon, San d imas Experimental Forest, 1-2 miles North of Glendora on Big d alton Road, 34.1627, -117.8196, 483 m, 17-IV-2017, JA Cole, K Halsey, LACM, 1♂; Chaney Trail Drive, Altadena, near jct. Loma Alta Drive, 34.20696, -118.14840, 546 m, 17-18-VI-2015, JA Cole, GE Bell, y Tiemsanjai, S Tipyatabiankarn, JAC, 1♂; Millard Canyon Campground, Angeles National Forest, end of Chaney Trail Rd., 34.2162, -118.1484, 546 m, 1-VIII-1954, RH Crandall, LACM, 2♂; same data except 13-14-VI-2007, JA Cole, JF Eguizabal, LACM, 7♂, 5♀; same data except JAC, 1♀; same data except 29-30-V-2008, JA Cole, AMNH, 1♂, 1♀; same data except LACM, 5♀; same data except JAC, 1♀; same data except 6-VI-2007, JA Cole, LACM, 3♀; same data except 8-VI-2007, JA Cole, LACM, 1♂; same data except JAC, 1♂; Pasadena, above Arroyo Seco near d evil's Gate d am, 34.22059, -118.17836, 320 m, 9-XII-2003, JN Hogue, CSUN, 2♂; Tanbark Flat, 34.20389, -117.76061, 18-VII-1956, A Menke Jr, LACM, 1♀; QUESTIONABLE PLACEMENT: (n=3) **USA, CA, Los Angeles Co.**, Eaton Saddle Trailhead, Angeles National Forest, 34.23928, -118.09336, 1549 m, 13-IX-2023, JA Cole, C Wong, LACM, 1♂; Highland Park, 34.111953, -118.198962, 183 m, 10-VIII-1975, no collector, CAS, 1♀; San Rafael Hills, 34.179728, -118.210629, 7-X-1956, CL Hogue, LACM, 1♀.