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A NEW SOUTHERN NEVADA SPECIES OF *AEGIALIA* (*AEGIALIA*) (COLEOPTERA: SCARABAEIDAE: APHODIINAE)

ROBERT D. GORDON[1] AND RICHARD W. RUST[2]
[1] P.O. Box 65, Willow City, ND 58384
[2] Biology Department, University of Nevada, Reno, NV 89557

Abstract.—A new species, *Aegialia* (*Aegialia*) *knighti* Gordon and Rust is described and illustrated. *Aegialia knighti* is from an isolated sand dune in southern Nevada and constitutes the fifth member in a flightless, inland clade of North American *Aegialia.*

Key Words.—Insecta, Scarabaeidae, *Aegialia*, psammophilous, Southern Nevada.

The genus *Aegialia* is represented by 30 species in North America (Gordon & Cartwright 1988, 1977; Gordon 1990). *Aegialia* are cold-adapted fossorial detritivores with both adult and larval stages active in the winter. They are psammophiles, found on coastal dune systems, inland dunes, or wherever the substrate is generally sandy such as river banks, lake shores and deltas (Brown 1931; Jerath & Ritcher 1959; Jerath 1960; Stebnicka 1977; Gordon & Cartwright 1977, 1988; Rust & Hanks 1982; Gordon 1990).

Here we describe a new species of *Aegialia* (*Aegialia*) from an isolated sand dune in southern Nevada.

AEGIALIA (*AEGIALIA*) *KNIGHTI*, NEW SPECIES

Types.—Holotype male (Figs. 1a, 2a) deposited in United States National Museum (USNM), Washington, DC, data: NEVADA. *CLARK Co.*: Logandale-Overton Exchange, R67E-T14S, 28 Dec 95, J. B. Knight, S. O. Cichowlaz. Allotype, female (Fig. 2b) deposited USNM, same data as holotype. Paratypes, 22 specimens—same data as holotype; 27 specimens data: NEVADA. *CLARK Co.*: Logandale-Overton Exchange, R67E-T14S, 17 Dec 1995, J. B. Knight, S. O. Cichowlaz. Ten paratypes are in the USNM, 4 in the Nevada State Department of Agriculture collection in Reno, Nevada, 10 in the California Academy of Sciences, San Francisco, 10 in the Natural History Museum, London, England, 10 in the University of Nebraska collection in Lincoln, Nebraska and 5 in the California State Department of Food and Agriculture collection in Sacramento, California.

Description.—Holotype. Male (Figs. 1a, 2a) length 4.3 mm, greatest width 2.4 mm. Form oval, convex, broad posteriorly. Color pale yellowish red except mouthparts and tibial spurs reddish brown to black and ventral surfaces lighter in color, exoskeleton translucent. Pubescence straw-yellow to golden-yellow, setae on legs bright golden-yellow. Head shiny, weakly alutaceous, some small, widely separated punctures in central area; clypeus weakly emarginate; gena slightly produced. Pronotum shiny, smooth, some shallow widely separated punctures throughout, posterior marginal line well developed. Elytron smooth, shiny, intervals nearly flat, finely punctate, punctures separated by twice a punctures width. Metasternum shiny, with fine punctures centrally becoming alutaceous laterally, lacking medial impunctate area. Hindwing reduced to very small lobe. Front tibia with middle and basal teeth narrowly acute, middle longer than apical tooth (Fig. 1a). Middle tibia with two well developed transverse ridges, without surface denticles, tibial spurs narrow, acute, outer spur longer and subequal to first three tarsal segments. Hind tibia with two transverse ridges, basal ridge only

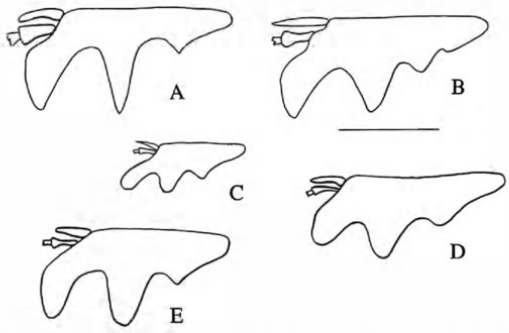

Figure 1. Fore tibia of inland, flightless North America *Aegialia* species. A. *A. knighti.* B. A. *magnifica.* C. *A. concinna.* D. *A. crescenta.* E. *A. hardyi.* Measurement line = 0.5 mm.

formed half way across tibia, transverse ridges and apical ridge with small broad setae; tibial spurs broadly spatulate, outer spur longer and subequal to first and second tarsal segments. Male genitalia as in Fig. 2a. Allotype.—Similar to male except length 4.4 mm, greatest width 2.5 mm. Female genital plate as in Fig. 2b.

Diagnosis:—Aegialia knighti is extremely similar to *A. magnifica* and will key to *A. magnifica* in Gordon & Cartwright (1988). *Aegialia knighti* differs from *A. magnifica* in being smaller (3.6 to 4.5 versus 4.4 to 5.9 mm in length and 2.1 to 2.4 versus 2.4 to 3.2 mm in greatest width), color pale yellow-red versus red, in having the basal and middle front tibial teeth acute (figs, 1a, 1b), in having broad setae on the hind tibial ridges versus lacking setae, and in lacking a median impunctate area on the central metasternum. The male and female genitalia are very different from *A. magnifica* (figs. 2a, 2b) and are more similar to *A. crescenta* (figs. 26, 29 in Gordon and Cartwright 1988). The key to *Aegialia* (*Aegialia*) (Gordon and Cartwright 1988) must be modified as follows:

11. Color pale red to pale yellow-red; head smooth, lacking tubercles, granules, or coarse punctations (fig. 16) 11A
Color dark brown to nearly black (except *concinna*); head rough, with coarse granules, punctations, or rugae 12

11A. Color pale red; large, 4.4–5.9 mm long and 2.4–3.2 mm greatest width; front tibial teeth rounded, not acutely pointed ..... *A. magnifica*
Color pale yellow-red; small, 3.6–4.5 mm long and 2.1–2.4 mm greatest width; front tibial basal and middle teeth acutely pointed ... *A. knighti*

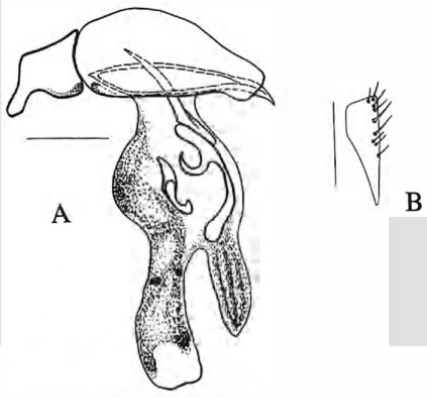

Figure 2. Genitalia of *Aegialia knighti.* A. Male. B. Female. Measurement lines = 0.25 mm.

Aegialia knighti is closely associated with and a member of the inland dune, reduced wing and flightless clade identified by Porter & Rust (1996). Its close resemblance to *A. magnifica* suggests they may be sister species, but a cladistic analysis is required to know the relationship of clade members, particularly because the genitalic structures of *A. knighti* are not closely similar to those of *A. magnifica* but are strikingly like those of *A. crescenta* and *A. hardyi*. The male internal sac of *A. knighti* has the same number of sclerites as does *A. crescenta* and the form of these sclerites, especially the large primary sclerite, is little different from that of *A. crescenta* and *A. hardyi*. *Aegialia knighti* has the female genital plate shaped like that of *A. hardyi* except with the apex obliquely angled rather than truncated as in *A. hardyi*.

Variation.—Length ranges from 3.6 to 4.5 mm and greatest width from 2.1 to 2.5 mm.

Habitat.—*Aegialia knighti* was collected from low, red sand hills and sand blow-outs in an area of approximately 12 km^2 that extends south of Mormon Mesa ridge and north and east of the Meadow Valley Wash-Wieser Wash-Muddy River drainage system from the Logandale-Overton exchange on Interstate 90 southward approximately 6 km to Logandale, Nevada. The Mojave Desert vegetation in the area is characterized by Creosote Bush (*Larrea tridentata* Nuttall), Mojave Yucca (*Yucca schidigera* Roezl ex Ort.), White Bur Sage (*Ambrosia dumosa* Payne), Brittlebush (*Encelia farinosa* A. Gray), species of *Opuntia* cactus, and species of *Atriplex*. The area ranges in elevation from 550m at the Logandale-Overton exchange to 450m near Logandale. The area receives approximately 9.5 cm of precipitation per year, which may fall in any month. The area has a mean annual temperature of 18° C with a mean minimum winter temperature of −4° C and mean summer maximum temperature of 40° C (Houghton et al. 1975).

Biology.—*Aegialia knighti* was collected by sifting sand from beneath *Ephedra* plants. No adults were observed on the surface sand during any of the three visits. Larvae were not obtained. *Aegialia knighti* appears to be very sensitive to soil moisture during the winter activity period. When the sand hills were first visited, the sand was moist a few centimeters below the surface and the individuals were very easy to collect. The sand hills were visited again on 28 Dec 1995 and a second series of specimens was easily obtained. The area was visited a third time on 16 Jan 1996 and only two individuals were collected by sifting sand. The sand hills had become dry and moist sand was not found until a depth of one meter was reached, much sand was sifted to procure the two individuals.

Etymology.—We name this species for Jeff Knight who collected the new species and is continuing to study and collect the insects of Nevada.

Material examined.—2 specimens data: NEVADA. *CLARK Co.*: 1 mi E of Logandale, 36°36′31.2″ N, 114°27′44.3″ W, Jan 12 1996, J. B. Knight, in the collection of the Nevada State Department of Agriculture.

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