

SCIENTIFIC NAME: *Andrena blennospermatis*
COMMON NAME: None; a vernal pool andrenid bee
CLASS, FAMILY: Insecta, Andrenidae

ORIGINAL DESCRIPTION: Thorp, R.W. 1969. Systematics and ecology of bees of the subgenus *Diandrena* (Hymenoptera: Andrenidae). University of California Publications in Entomology 52:81, figs. 1, 19, 20, 56, 63, 75 (flight period diagram, labral process of female and male, diagram of suggested species relationships, male genital capsule, and metasomal sternum 8), and Map 13 (distribution).

TYPE MATERIAL: *Holotype:* female - California: Yolo County; Esparto, 24 Feb 1954, K.W. Tucker, collector; deposited in the California Academy of Sciences, type #10287. *Allotype:* male - same data as holotype; deposited in the California Academy of Sciences. Ten male paratypes, same data as holotype, are deposited in the Bohart Museum of Entomology, University of California, Davis.

RANKING/STATUS: G2S2 (NatureServe – CNDDDB).

GENERAL DESCRIPTION: Males and females are rather slender, dark-olive green bees with pale apical bands on the dorsum of the metasomal (= most of abdominal) segments; females measure 8.5-9.5 mm, males 7-8 mm.

DIAGNOSTIC CHARACTERS: Females are distinguished from the similar *A. puthua* by their larger size and broadly truncate apex of the labral process; males by their flattened third antennal segment, recurved metasomal apex, and broadly expanded apex of the last visible sternum. Males of *A. submoesta* also have the third antennal segment flattened and expanded, but *A. blennospermatis* flies earlier in the spring in association with the bloom of its *Blennosperma* plant hosts.

OTHER ILLUSTRATIONS: A color photo of this species is available on the web at www.vernalpools.org/Thorp/ (fig. 1; also shown as fig. 1 in Thorp 1990). Other figures on this page show *Andrena* nest architecture. Thorp (1990) also illustrates the nest architecture and life history stages in figs. 7-12.

DISTRIBUTION: Thorp (1969) recorded *A. blennospermatis* from a limited area of the inner Coast Ranges (Contra Costa, Lake, Sonoma, and Yolo Counties), but since the time of its description, the species' known distribution has expanded to include Tehama, Solano, San Joaquin, Sacramento, El Dorado, and Placer Counties (Thorp and Leong 1998)

HABITAT: Upland areas near vernal pools.

LIFE HISTORY/BEHAVIOR: *Andrena blennospermatis* is a solitary, ground-nesting bee. Thorp and Leong (1995) summarize the life history of this species. Adults emerge early in the spring, with males emerging slightly earlier and dying off sooner than females. After emergence, the females mate, and then begin excavating nests in the upland areas near vernal pools. The nest consists of a shallow tunnel terminating in a brood chamber, or cell, where the larva develops into an adult bee. The mother

bee provisions the cell with *Blennosperma* pollen, which she shapes into a small dough-like ball with the addition of a small amount of nectar. She then lays a single egg on the pollen ball and seals the cell. The female constructs a number of nests, and lays fewer than three dozen eggs in her lifetime. There is no parental care as in social bees; the larva passes through several instars, undergoes pupation in the fall, and overwinters in the cell as an adult. The next spring the adults emerge and the cycle begins again. The flight period for females ranges from late February to late April. All of the males Thorp examined were collected on February 24, so more collection data is needed to determine their flight period. Females have been collected from both *Blennosperma nanus* and *B. bakeri*, and forage during the middle of the day.

A study at Jepson Prairie Preserve in Solano County (Leong 1994, Thorp and Leong 1995, Leong, Randolph, and Thorp 1995) demonstrated that *Andrena blennospermatis* spatially restricts its foraging activities to near-neighbor flowers. They studied three patches (orange, yellow, and white) of *Blennosperma nanus nanus* where they marked and recaptured female *Andrena blennospermatis*, and found that fewer than 10% of the bees from the white and orange patches simultaneously foraged outside of that flower patch, and none of the bees from the yellow patch foraged elsewhere. Thus, these bees may have difficulty colonizing areas around artificially-constructed vernal pools, because of their limited flight ability and low dispersal tendencies. Leong (1994) also studied an artificially-created vernal pool at the Davis Interchange, at the intersection of Interstate 80 and Highway 113 in Davis. She observed that andrenid bees were absent, and even generalist pollinators such as syrphid and empidid flies showed greatly diminished flower visitation rates, indicating that artificial vernal pools may lack sufficient pollinator activity to insure adequate seed production by vernal pool plant species.

SELECTED REFERENCES:

- Leong, J.M. 1994. Pollination of a patchily-distributed plant, *Blennosperma nanum*, in natural and artificially created vernal pool habitats. Ph.D. dissertation, University of California, Davis.
- Leong, J.M., Randolph, R.P., and R.W. Thorp. 1995. Observations of the foraging patterns of *Andrena (Diandrena) blennospermatis* Thorp (Hymenoptera: Andrenidae). *Pan-Pacific Entomologist* 71(1):68-71.
- Thorp, R.W. 1990. Vernal pool flowers and host specific bees. pp. 109-122. *In* Ikeda, D.H. and R.A. Schlising, eds., *Vernal Pool Plants – Their Habitats and Biology*. Studies from the Herbarium, No. 8, California State University, Chico.
- Thorp, R.W. and J.M. Leong. 1995. Native bee pollinators of vernal pool plants. *Freemontia* 23(2):3-7.
- Thorp, R.W. and J.M. Leong. 1998. Specialist bee pollinators of showy vernal pool flowers. *In* C.W. Witham, E.T. Bauder, D. Belk, W.R. Ferren, Jr., and R. Ornduff (Editors). *Ecology, Conservation, and Management of Vernal Pool Ecosystems – Proceedings from a 1996 Conference*. California Native Plant Society, Sacramento, CA. pp. 160-179.

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