

SCIENTIFIC NAME: *Branchinecta campestris*
COMMON NAME: Pocket pouch fairy shrimp
CLASS, FAMILY: Branchiopoda, Branchinectidae

ORIGINAL DESCRIPTION: Lynch, J.E. 1960. The fairy shrimp *Branchinecta campestris* from northwestern United States. Proceedings of the U. S. National Museum 112:549-561. Figures as follows:

- Fig. 1A-B: lateral views of male and female.
Fig. 2A-D: anterior views of head of male and female, spine from distal median border of endopodite of sixth thoracic appendage of male, and end view of distal end of second antenna.
Fig. 3A-C: right sixth thoracic appendage of male, female, and spine from distal median border of endopodite of sixth thoracic appendage of female.
Fig. 4A-D: cuticle from dorsal side of female thoracic segments, left bosse and sensory bristle from eighth thoracic segment of a female, outline of cross-section of basal article of right antenna of male, and right penis and adjacent part of second genital segment of male.
Fig. 5A-E. variations in lateral outpocketings of the brood pouch of females.

TYPE MATERIAL: *Holotype:* Female - Washington: Grant County; alkaline pond about 12 miles south of the town of Moses Lake, 11 Apr 1948, collected by J.E. Lynch; deposited in the U.S. National Museum of Natural History, accession #104128, with 12 male and 12 female paratypes, accession #104129. The USNM online catalog disagrees with Lynch by stating that there are 20 male and 21 female paratypes in alcohol, and giving the type locality as 15, not 12, miles south of Moses Lake. The exact collection date was obtained from the USNM catalog.

RANKING/STATUS: G4S1 (NatureServe – CNDDDB).

GENERAL DESCRIPTION: Individuals of *Branchinecta campestris* are typical fairy shrimp in appearance; adults measure about 16-30 mm in length. The smallest mature female collected by Lynch was only 12 mm long, and its brood pouch contained two cysts.

DIAGNOSTIC CHARACTERS: Females have first antennae equal to or shorter than the second antennae, and possess conical outpocketings in the midlateral area of the brood pouch. Males of *Branchinecta campestris* are similar to those of *B. mackini*, but the distal tip of the second antenna is produced laterally in *B. campestris*, rather than truncated or slightly flattened, as in *B. mackini*.

OTHER ILLUSTRATIONS: Ericksen and Belk (1999) show the distribution of this species in California in Map 5.12. They also illustrate the lateral view of the male and female in Fig. 5.1, the frontal view of the left half of the male head in Fig. 7.16B, and ventral views of the brood pouch with its conical outpocketings in Fig. 7.17. Rogers (2002, fig. 7) also illustrates the brood pouch outpocketings of the female. Scanning

electron micrographs of the cyst and fractured cyst wall are shown in Mura (1991, figs. I-4 and II-4) and Hill and Shepard (1997, figs. 18, 32), and of the cyst and cross section of the cyst wall in Shepard and Hill (2001, figs. 5-6).

DISTRIBUTION: This species is known from a handful of localities in Washington, and one location each in Oregon and California. NatureServe (2005) records from other areas may represent an undescribed species (Rogers, pers. comm.).

HABITAT: Unlike other *Branchinecta* species in California, *B. campestris* is tolerant of highly alkaline saline water. In North America the only anostracans that can tolerate higher salinity are the brine shrimps *Artemia monica* and *A. franciscana*, both of which are also found in California. Water at the Soda Lake collection site had pH readings of 9.5-10, and about 95% of the ions present were Na^+ , Mg^{++} , and SO_4^- . According to Rogers (2004) adults of this species are present in Soda Lake only in El Niño years, apparently because of favorable changes in salinity.

LIFE HISTORY/BEHAVIOR: Like other species of fairy shrimp, *Branchinecta campestris* females produce desiccation-resistant cysts which hatch under favorable environmental conditions. Broch (1969) reported that individuals of this species reached full maturity about a month after hatching.

Individuals of *Branchinecta campestris* sometimes coexist with those of *Artemia franciscana*, dividing their shared habitat by season. *Branchinecta campestris* prefers the cooler, relatively lower-salinity phase of seasonal lakes and pools than *Artemia*, which peaks later in the season as water temperature and salinity rise, but populations of the two overlap for part of the year. Belk and Serpa (1992) observed that males of *Artemia franciscana* sometimes attempted to clasp and mate with females of *Branchinecta campestris*. Attempts by the females to dislodge males were usually unsuccessful, indicating that *Artemia* males exert more control over mating than other anostracans. The lack of female selection on male morphological characters may explain the existence of sibling species of *Artemia*.

SELECTED REFERENCES:

- Belk, D., and L. Serpa. 1992. First record of *Branchinecta campestris* (Anostraca) from California and casual observations of males of *Artemia* clasping females of *Branchinecta*. *Journal of Crustacean Biology* 12(3):511-513.
- Broch, E.S. 1969. The osmotic adaptation of the fairy shrimp *Branchinecta campestris* Lynch to saline astatic waters. *Limnology and Oceanography* 14:485-192.
- Ericksen, C., and D. Belk. 1999. Fairy Shrimps of California's Puddles, Pools, and Playas. 1999. Mad River Press, Eureka, California. xiv + 196 pp.
- Hill, R.E., and W.D. Shepard. 1997. Observations on the identification of California anostracans cysts. *Hydrobiologia* 359:113-123.
- Mura, G. 1991. SEM morphology of resting eggs in the species of the genus *Branchinecta* from North America. *Journal of Crustacean Biology* 11: 432-436.
- NatureServe Online Explorer, <http://www.natureserve.org/explorer/>, accessed 10/27/2005.

Rogers, D.C. 2002. Female-based characters for anostracan (Crustacea: Branchiopoda) identification: A key for species of California and Oregon, USA. *Hydrobiologia* 486:125-132.

Rogers, D.C. 2004. Letter to California Department of Fish and Game.

Shepard, W.D. and R.E. Hill. 2001. Anostracan cysts found in California salt lakes. *Hydrobiologia* 466:149-158.

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